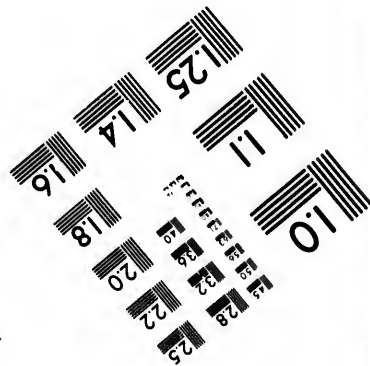
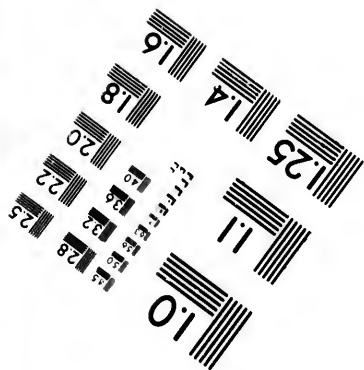
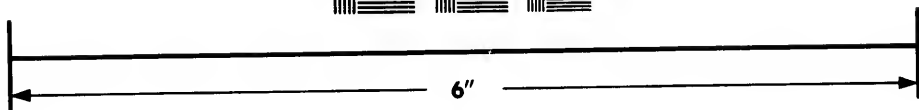
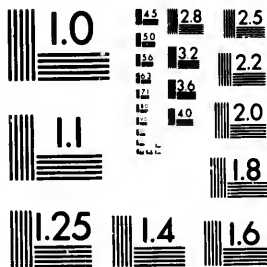


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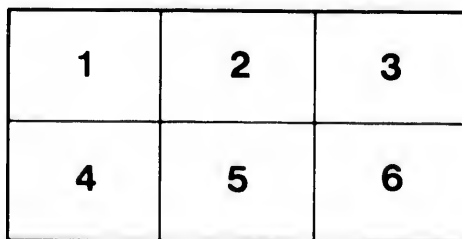
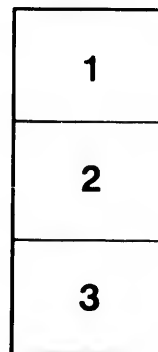
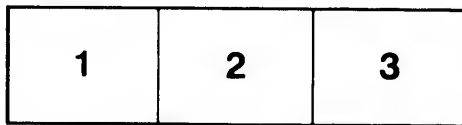
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VANCOUVER ISLAND PILOT.  
SUPPLEMENT.

---

COAST OF BRITISH COLUMBIA  
FROM QUEEN CHARLOTTE SOUND TO  
PORTLAND CANAL,

INCLUDING

QUEEN CHARLOTTE ISLANDS.

---

COMPILED CHIEFLY FROM ADMIRALTY SURVEYS.

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PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

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## ADVERTISEMENT.

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The Vancouver Island Pilot Supplement contains sailing directions for the coast of British Columbia between Queen Charlotte sound and Portland canal, and for the adjacent inner channels. Also a description of Queen Charlotte islands.

Those relating to the coast of British Columbia and the inner channels have been chiefly derived from surveys conducted by Staff-Commander D. Pender, R.N., during the years 1864-70, under the directions of the Lords Commissioners of the Admiralty.

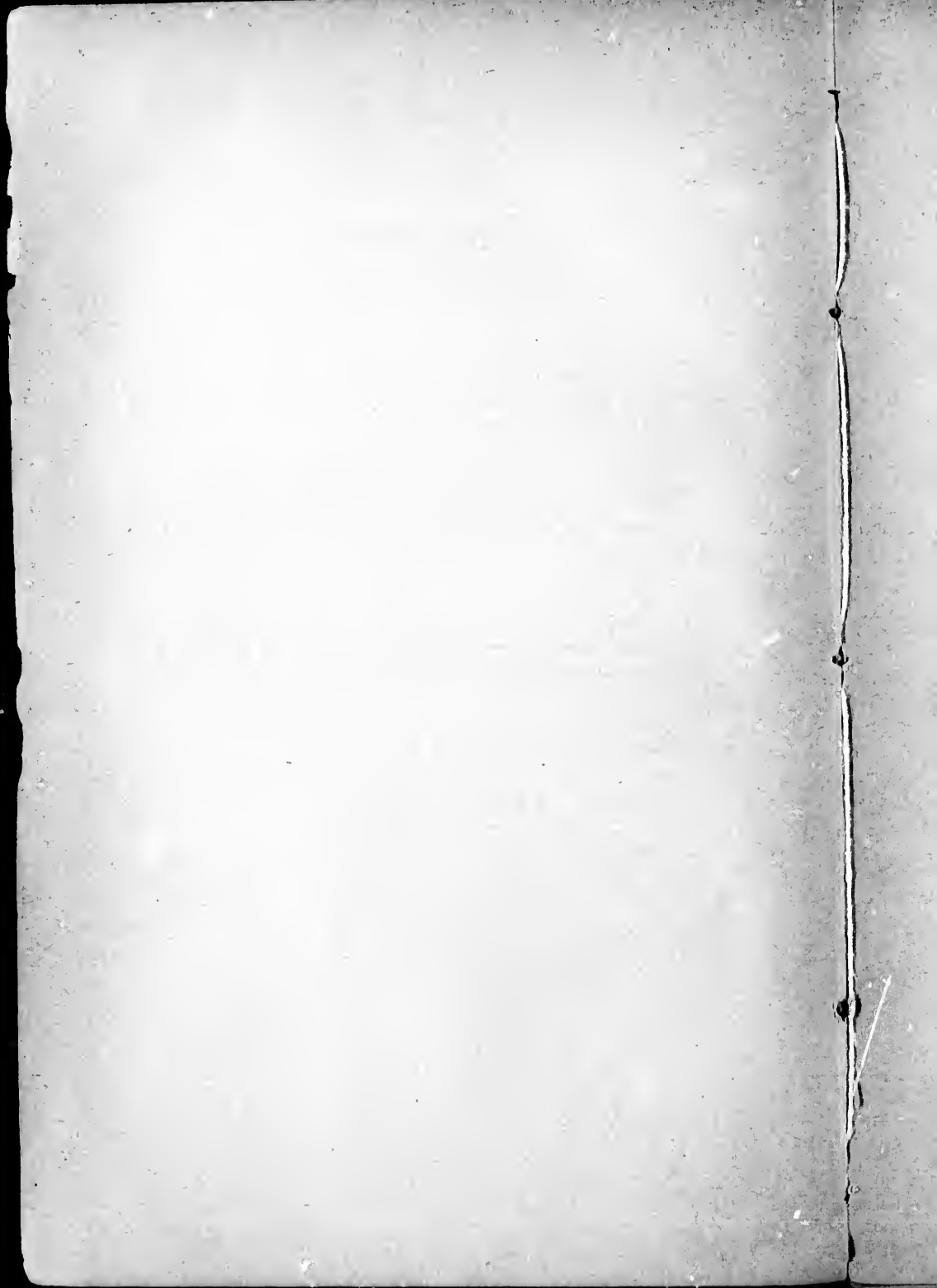
The descriptions of Queen Charlotte islands have been derived from the Report on those islands by G. M. Dawson, Esq., F.G.S., published by the Government of Canada, 1880, to which has been added the published directions resulting from a visit of H.M.S. *Virago* in 1853.

In this Supplement, the most recent information derived from the Remark books of Officers of Her Majesty's ships, and from other sources has also been embodied.

F. J. E.

Hydrographic Office, Admiralty, London,  
June 1883.





# CONTENTS.

---

## CHAPTER I.

### INNER CHANNELS.—QUEEN CHARLOTTE SOUND TO SEAFORTH CHANNEL.

	Page
General remarks. Shadwell passage. Cape Caution. Sea Otter group.	
South passage. Smith sound - - - - -	1-6
Alexandra passage. Beaver passages. Long point - - - - -	6-8
Takush harbour. Fitz-Hugh sound - - - - -	8-10
Cape Calvert. Schooner retreat - - - - -	10-12
Safety cove. Goldstream harbour. Namu harbour - - - - -	12-14
Burke channel. Lama passage. Cooper inlet - - - - -	14-16
McLaughlin bay. Bella Bella islands. Klick-Tso-Atili harbour. Gun- boat passage - - - - -	16-18
Seaforth channel. Kynumpt harbour. Cod bank. Anchorage - - - - -	18-19

## CHAPTER II.

### MILBANK SOUND TO CHATHAM SOUND.

Landmarks. Discovery rock. Vancouver rock - - - - -	20-22
Cross ledge. Beaver bank. Price island - - - - -	22-23
Directions approaching Millbank sound. Mathieson channel. St. John harbour. Anchorage. Caution - - - - -	24-26
Port Blakeney. Tides. Supplies. Directions. Morris bay. Direc- tions. Anchorage - - - - -	26-28
Alexandra passage. Schooner passage. Finlayson channel - - - - -	28-29
Cone island. Carter bay. Hie Kish narrows - - - - -	30-32
Klemtoo passage. North passage. Tolmie channel. Graham reach - - - - -	32-34
Fraser reach. Wark island. McKay reach. Wright sound - - - - -	34-36
Holmes bay. Promise island. Coghlan anchorage. Tidal streams - - - - -	36-38
Grenville channel. Lowe inlet - - - - -	39-40
Klewnuggit inlet. Stuart anchorage - - - - -	40-42
False Stuart anchorage. Kennedy island. Arthur passage - - - - -	42-43
Lawson harbour. Chismore passage. Malacca passage. Skeena river	44-46
Telegraph passage. Port Essington - - - - -	46-47

## CHAPTER III.

### CHATHAM SOUND, EDYE AND BROWN PASSAGES AND DIXON ENTRANCE.

Chatham sound, general remarks. Landmarks. Dangers. Soundings. Anchorage - - - - -	48-50
---	-------

	Page
Southern portion. Tsimsean peninsula. Metlah-Catlah. Duncan bay. Tides - - - - -	50-56
Tree bluff. Big bay, directions - - - - -	56-58
Burnt cliff island. Finlayson island. Pearl harbour - - - - -	58-59
Sparrowhawk rock. Cunningham passage. Port Simpson. Directions	60-63
Inskip passage. Fort Simpson. Indian villages. Climate. Tides -	63-67
Prescott and Stephens islands. Edey passage. Göschen island. Refuge bay. Tides - - - - -	67-70
Brown passage. Qlawdzeet anchorage. Tides - - - - -	70-72
Dundas islands. Moffatt islands - - - - -	72-73
Hammond rock. Main passage. Oriflamme passage. Gnarled islands. Dixon entrance - - - - -	74-76
Cape Fox. Lord islands. Tongas islands. Wales island - - - - -	76-77
Tides. Winds. Fogs. Climate - - - - -	77-79

## CHAPTER IV.

## INNER WATERS.—LAREDO SOUND TO OGDEN CHANNEL.

Laredo sound. Nab rock. North Bay islands. Directions. Laredo channel. Campania sound - - - - -	80-84
Squally channel. Lewis passage. Farrant island - - - - -	84-86
Union passage. Estevan sound. Campania island - - - - -	86-88
Breaker point. Nepean sound. Otter passage. Principe channel -	88-90
Port Stephens. Mink Trap bay. Port Canaveral. Directions. Tides	90-93

## CHAPTER V.

## OUTER COAST, CAPE CALVERT TO OGDEN CHANNEL.

Calvert island. Hakai channel. Welcome harbour. Tides. Directions	94-97
Nalau passage. Queen's sound. Plumper channel. Hecate channel -	97-98
Bardswell group. Gander islands. Estevan island - - - - -	99-101
Banks island. South rocks. Bonila island. Ogden channel -	102-106
Spicer island. Beaver passage. Schooner passage - - - - -	106-107
Alpha bay. Soundings - - - - -	108

## CHAPTER VI.

## PORTLAND AND OBSERVATORY INLETS AND PORTLAND CANAL.

Portland inlet. Somerville island. Portland point. Nass bay -	109-112
Iceberg bay. Nass river. Observatory inlet - - - - -	113-115
Salmon cove. Alice arm. Portland canal. Current. Climate. Supplies - - - - -	115-118
Dog fish bay. Halibut bay. Centre island. Pirie point. Round point. Salmon river. Anchorage - - - - -	119-124

## CHAPTER VII.

## QUEEN CHARLOTTE ISLANDS.

	Page
General remarks. Prevost island. Cape St. James. Houston Stewart channel, directions. Rose harbour. Moresby island - -	125-128
Carpenter bay. Collison bay. Skincuttle inlet. Burnaby strait and island. Skaat harbour - - - - -	129-132
Juan Perez sound. Ramsay island, &c. Remarks. Lyell island -	132-134
Darwin sound. Tides. Shuttle island. Echo harbour. Klun Kwoi bay. Crescent islet. Laskeek bay. Richardson inlet. Tides - -	134-136
Dana and Selwyn inlets. Rockfish harbour. Cumshewa inlet, remarks. Skidegate inlet and channel. Directions. Tides - -	137-143
The coast. Capes Ball and Fife. Rose point. Hecate strait. Masset sound and inlets. Virago sound - - - - -	143-150
Parry passage. North island. Cape Knox. Skidegate channel. Inskip and Moore channels. Mitchell harbour. Tasoo harbour. Supplies. Weather - - - - -	151-156

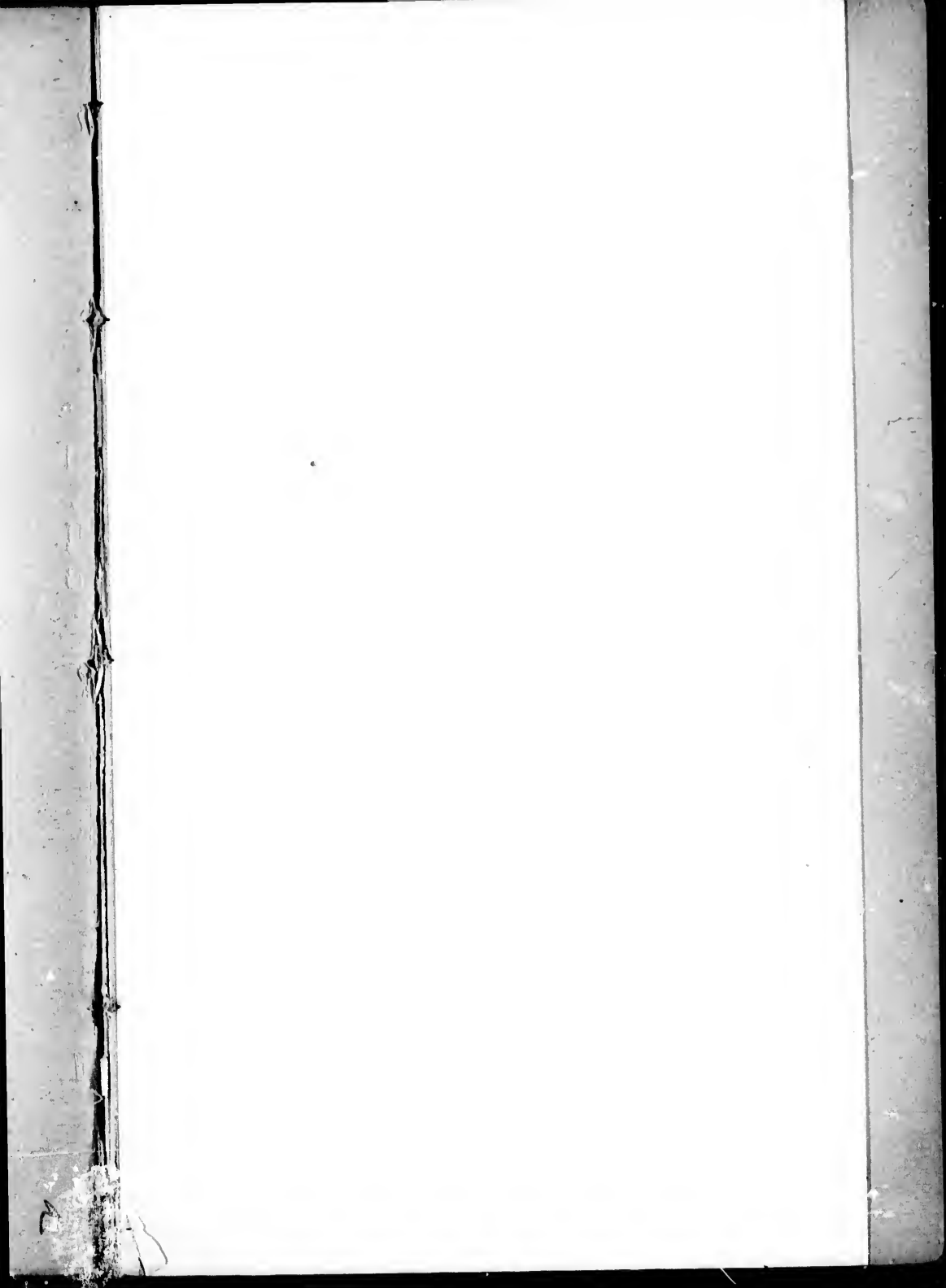
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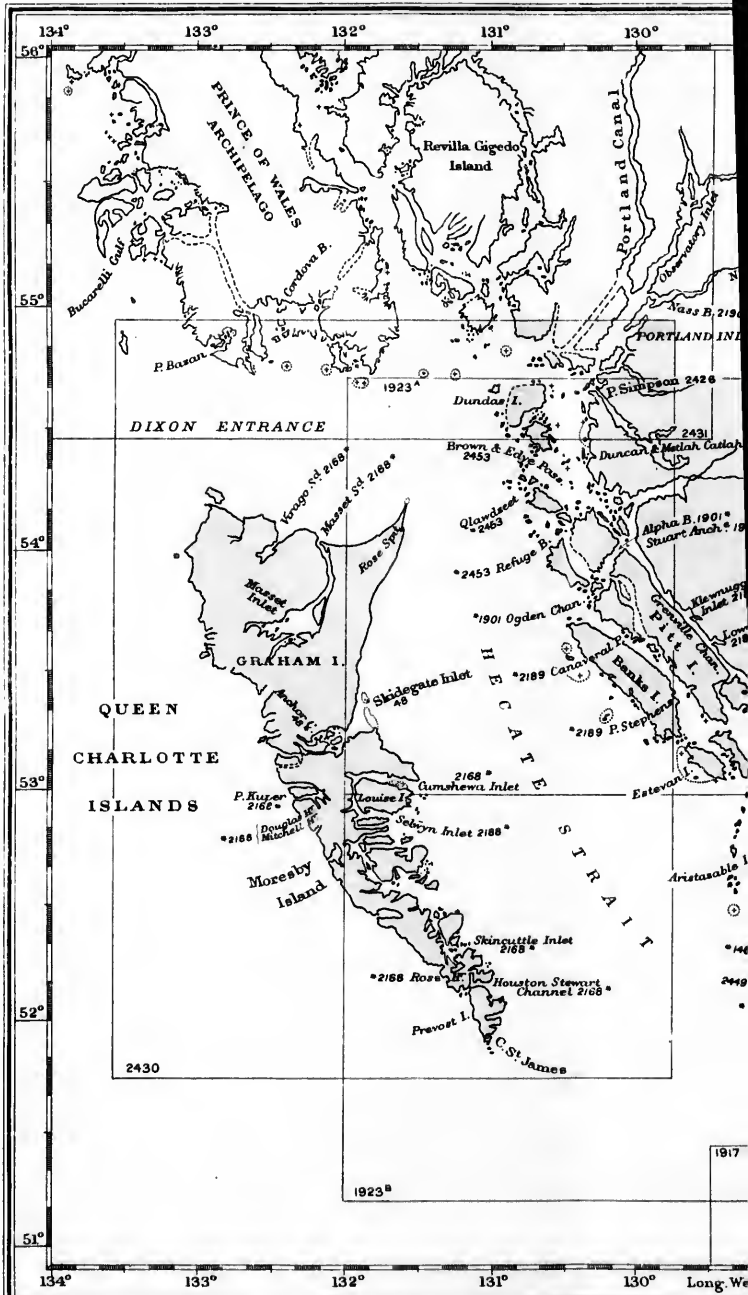
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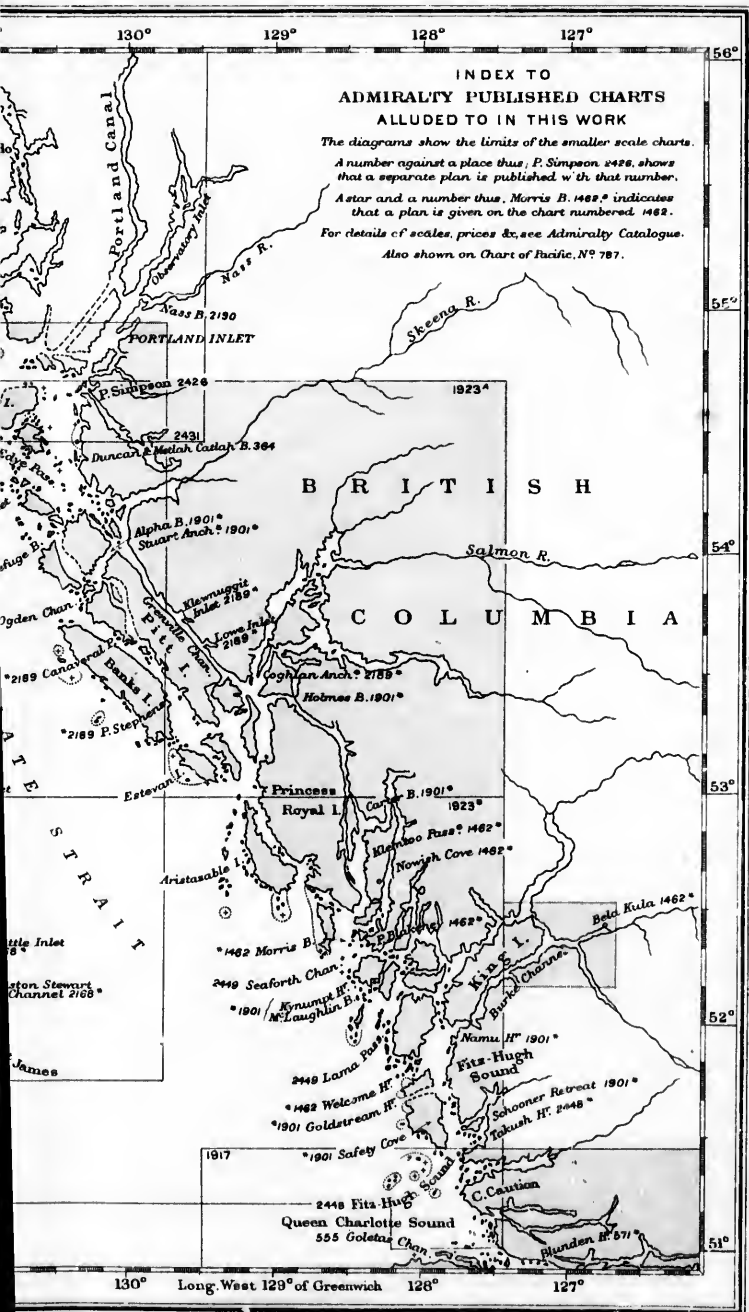
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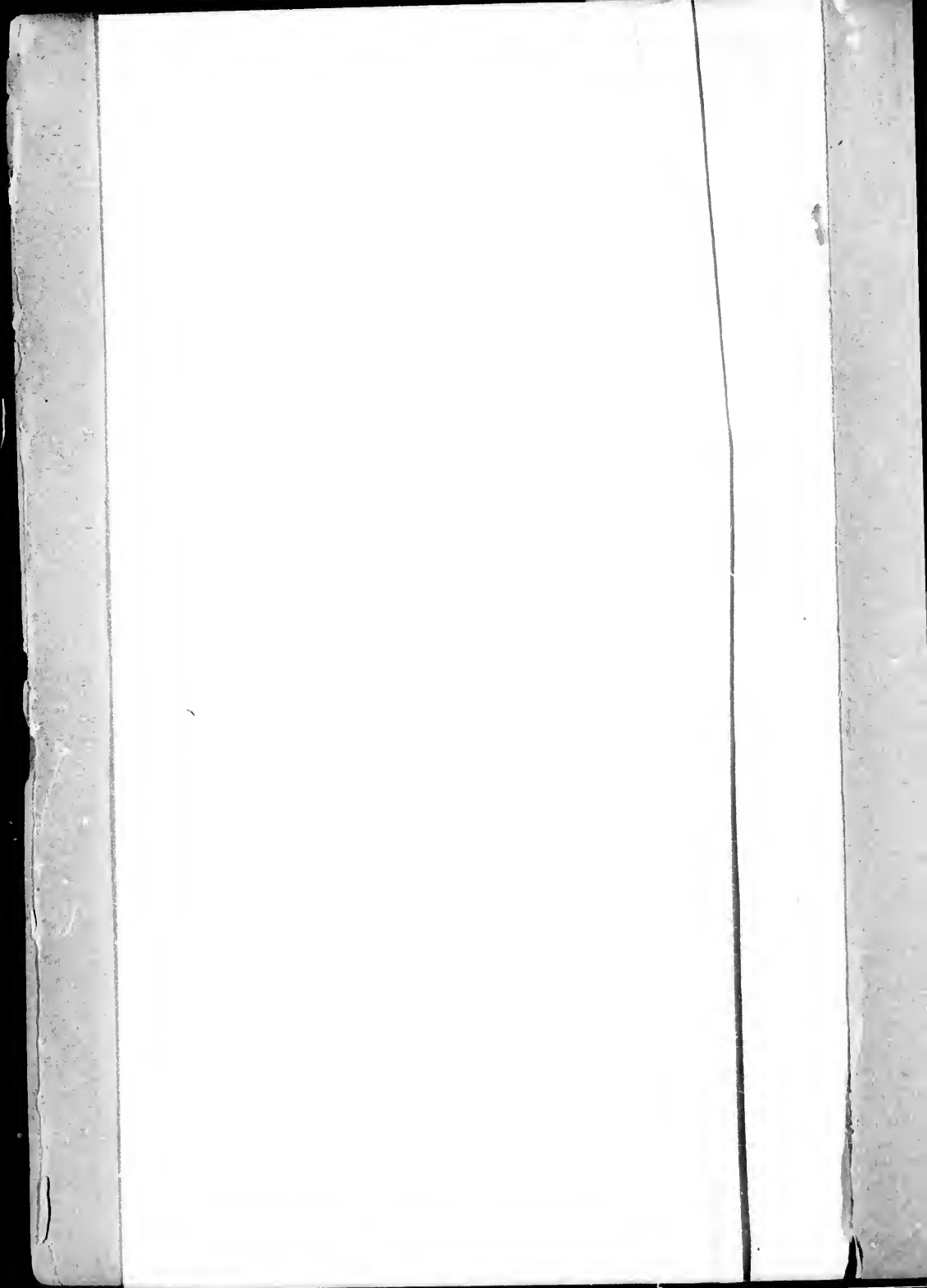




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# VANCOUVER ISLAND PILOT.

## SUPPLEMENT.

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### CHAPTER I.

#### INNER CHANNELS.—QUEEN CHARLOTTE SOUND TO SEAFORTH CHANNEL.

---

#### VARIATION IN 1883.

Queen Charlotte sound, 24° 20' E. | Seaforth channel, 25° 20' E.

---

**GENERAL REMARKS.**--The inner channels, herein described, of the seaboard of British Columbia afford smooth water, together with anchorages at suitable distances, for vessels of moderate length.

These channels, therefore, offer facilities to steam vessels for avoiding the strong gales, and thick weather so frequently met with in Hecate strait. They are also available for fore-and-aft schooners, when navigating between Vancouver island and Alaska.

Unless directed to the contrary, the mid channel is recommended to be kept when navigating these inner waters.

**SHADWELL PASSAGE.\***--**Suwanee rock**, on which the U.S. Steamship *Suwanee* was wrecked in 1868, lies 95 fathoms W. by S.  $\frac{3}{4}$  S. (S. 70° W.) from the high-water mark of Centre island. It dries 4 feet at very low spring tides, and renders the passage west of Centre island, unsuitable for any but small vessels locally acquainted.

---

\* See Admiralty charts:--Vancouver island to Cordova bay, No. 2,430; scale,  $m=0.13$  of an inch. Vancouver island, and views, No. 1,917; scale,  $m=0.15$  of an inch. Goletas channel to Quatsino sound, No. 532; scale,  $m=0.5$  of an inch. Goletas channel, No. 555; scale,  $m=2.0$  inches; and cape Caution to port Simpson, southern portion, No. 1,923 B; scale,  $m=0.25$  of an inch.

**Directions.**—The south peak of Magin saddle (on the west end of Galiano island) in line with the east end of Centre island bearing S.S.E., leads through the northern entrance of Shadwell passage, passing half a mile east of cape James, (north-west point of entrance) and  $1\frac{1}{2}$  cables west of Breaker reef, in 9 to 17 fathoms water.

Vessels that do not steer well are recommended to use Bate passage instead of Shadwell passage. Cape James should at all times be given a berth of at least half a mile.

**Pine and Storm islands.**—These islands with their surrounding islets and reefs occupy the middle of the western approach to Queen Charlotte sound, and form the eastern margin of dangers between Shadwell passage and cape Caution.

**Pine island**, bold, rocky, and covered with trees, about 250 feet high, is  $4\frac{3}{4}$  miles N.E. by N. from cape James.

**Storm islands**, are a narrow chain of islands lying in an East and West direction about 2 miles long, and form a most useful land-mark when crossing Queen Charlotte sound.

The western of these islands bears from Pine island N.W. by N. 3 miles; from cape James N.  $\frac{3}{4}$  E.  $6\frac{3}{4}$  miles; and from cape Caution S.E. by S. distant 8 miles. There are no outlying dangers beyond 3 cables. The tops of the trees are from 150 to 200 feet high, and on the western part is a *single tree* which is conspicuous.

**Sunken rock**, on which the sea breaks in bad weather, lies about 5 miles N.E. of Shadwell passage; from the centre of the rock, Bright island bears S.E.  $\frac{1}{2}$  E.  $1\frac{1}{2}$  miles, and Pine island, west  $1\frac{1}{2}$  miles.

**Sealed passage**, 5 miles to the northward of Shadwell passage, between Pine island and Storm islands, is about  $2\frac{1}{2}$  miles wide, and has a reef (Blind reef) on which the sea breaks in heavy weather, extending nearly across; close to the west edge of Blind reef there are 17 to 40 fathoms, rock. This passage should not be attempted.

**Reid island**, the easternmost of the Storm islands, on the north side of Sealed passage, is about 300 yards long E.N.E. and W.S.W., and 150 yards broad, having a rock above water half a cable off its west end.

**Water** can be obtained at the Indian fishing station on Storm islands.

**South rock**, awash at low water, lies about  $1\frac{3}{4}$  miles north-eastward of Blind reef; from the centre of this rock, Pine island bears S.W. by S.  $3\frac{1}{4}$  miles nearly, and Reid island W.  $\frac{1}{4}$  N.  $1\frac{3}{4}$  miles.

**Middle rock**, on which the sea nearly always breaks, is covered at three-quarters flood, and lies N. by W. one mile from South rock.

**North rock**, on which the sea nearly always breaks, is awash at high water, and lies N.E. three-quarters of a mile nearly from Middle rock. Harris islet a little open south of Janette island, bearing E. by S.  $\frac{1}{2}$  S., leads half a mile to the northward of North rock.

**CAPE CAUTION** (Ka-Klees-la), the north-west entrance point of Queen Charlotte sound, is of moderate height and level, the tops of the trees being about 200 feet above the sea; the shore is white, and of granite formation, with a few rocks off it; the land north-east of the cape rises gradually in a distance of 5 miles to Coast nipple, 1,350 feet high, 2 miles to the eastward of which lies mount Robinson, 2,100 feet high.

**Soundings.**—In a south-westerly direction, from cape Caution, at a distance of 3 cables there is a depth of 9 fathoms, rocky-bottom; at one mile, 16 fathoms; at  $1\frac{3}{4}$  miles, 43 fathoms, white sandy bottom; thence for 7 miles in the same direction the average depth is 70 fathoms, rocky bottom. At 10 miles S.W. by W. from the cape and  $2\frac{3}{4}$  miles S.E.  $\frac{1}{2}$  S. from Danger shoal, the water shoals to 40 fathoms dark sand, and again deepens to 80 and 90 fathoms a short distance to the southward.

**SEA OTTER GROUP**,\* consisting of several dangerous rocks, islets, and shoals which cover a space of about 12 miles in extent north and south and 10 miles in an east and west direction, lies at a distance of 6 or 7 miles from the seaboard of British Columbia, fronting the coast between capes Caution and Calvert.

**Danger shoal**, on which the sea is reported to break in heavy weather, is the southernmost outlying danger of Sea Otter group, and lies W. by S.  $\frac{1}{2}$  S.  $10\frac{1}{2}$  miles from cape Caution; near the centre of this shoal there is a depth of 9 fathoms, with 22 fathoms close around. Shoaler water probably exists.

**Virgin rocks**, near the western limit of the group, consist of three white rocks, the largest of which (50 feet high), lies N.W. by W.  $\frac{1}{2}$  W.  $7\frac{1}{2}$  miles from Danger shoal, and West 17 miles from cape Caution. Southward of these rocks the 30-fathom line is 4 miles, and in a westerly direction it is 6 miles distant: rounding the rocks the soundings should not be reduced to less than 30 fathoms.

**Watch rock**, 74 feet high and black, lies near the northern limit of the group, N.  $\frac{3}{4}$  E.  $7\frac{1}{4}$  miles from Virgin rocks. The rock is steep-to.

**Pearl rocks**, the northernmost of Sea Otter group, are comprised of several rocks above and below water, extending  $1\frac{1}{2}$  miles in a north-west

---

\* See Admiralty chart:—Approaches to Fitz-Hugh and Smith sounds, No. 2,448; scale,  $m = 1\cdot0$  inch.

#### 4 QUEEN CHARLOTTE SOUND TO SEAFORTH CHANNEL. [CHAP. I.]

and south-east direction; the largest rock (15 feet high), lies E. by N. 3 miles from Watch rock, and the south-east rock, on which the sea always breaks, lies S.E. by E. one mile from the largest rock; there are 15 to 31 fathoms water, close-to on the north side of Pearl rocks; and 70 to 80 fathoms just eastward of them.

**Devil rock**, the north-eastern outlying danger, lies N.E.  $\frac{1}{2}$  E.  $1\frac{1}{2}$  miles from the largest Pearl rock; and S.S.W.  $\frac{1}{2}$  W. nearly 3 miles from Sorrow islands. The sea seldom breaks on Devil rock, and there is apparently deep water close around. There are from 80 to 40 fathoms between the rock and cape Calvert.

**New patch**, on which the sea generally breaks, is nearly 2 miles in extent, and lies S. by E.  $4\frac{1}{2}$  miles from the largest Pearl rock.

**Channel reef**, the easternmost danger of Sea Otter group, has about 6 feet over it at low water; from the centre of this reef, Table island, at the entrance of Smith sound, bears E. by N.  $\frac{1}{2}$  N.  $4\frac{3}{4}$  miles and Egg island E.  $\frac{1}{2}$  N.  $3\frac{2}{10}$  miles. The sea seldom breaks on Channel reef, and there are 60 fathoms close eastward of it.

**Hannah rock**, the south-easternmost outlying danger, on which the sea is nearly always breaking, is situated about  $2\frac{3}{4}$  miles south of Channel reef; Hannah rock is awash at high water, and from its centre, cape Caution bears E.  $\frac{1}{2}$  S. 8 miles, Egg island N.E. by E.  $5\frac{1}{4}$  miles, and Danger shoal S.S.W.  $\frac{1}{2}$  W.  $4\frac{7}{10}$  miles.

**Clearing mark**.—The south extremes of Egg and Table islands in line, bearing N.E.  $\frac{3}{4}$  N. leads clear to the south-eastward of Danger shoal, and all other dangers on the south-east side of Sea Otter group.

**SOUTH PASSAGE**, leading to Smith and Fitz-Hugh sounds from the southward, lies between cape Caution and the south-east limit of Sea Otter group where it is about 7 miles broad, with irregular soundings varying from 34 to 74 fathoms. False Egg island, its own breadth open west of Egg island, bearing N.  $\frac{1}{2}$  W., leads through South passage, nearly in mid-channel.

**Blunden bay**, a slight bend in the coast between cape Caution and Neck point, at  $1\frac{1}{2}$  miles N.W.  $\frac{1}{2}$  N. from it, is about one mile wide at its entrance, and nearly a mile deep; Indian cove, which lies in the northern part of this bay, affords good shelter for boats, it is the Indian rendezvous on their canoe voyages, when passing between Queen Charlotte and Fitz-Hugh sounds.

**Hoop reef**.—From Neck point the coast trends N. by W. 2 miles to Good Shelter cove, midway between which lies Hoop reef, about one-third of a mile from the shore; this reef is three-quarters of a mile north-west and south-east, and one quarter of a mile broad.

**South Iron rock**, on which the sea seldom breaks, lies three-quarters of a mile to the westward of Hoop reef, and nearly  $1\frac{1}{4}$  miles N.W.  $\frac{1}{2}$  W. from Neck point; there are 35 fathoms close-to, on the north side of the rock, and 25 fathoms in the channel between it and Hoop reef.

**North Iron rock**, which dries 7 feet, lies nearly in the fairway of Alexandra passage, N.N.W.  $\frac{1}{4}$  W. three-quarters of a mile from South Iron rock; there are 7 to 9 fathoms close to, and no bottom at 40 fathoms within a quarter of a mile of North Iron rock.

**Clearing marks.**—False Egg island in line with West rock off Table island, bearing N. by W.  $\frac{1}{2}$  W., leads 4 cables west of South and North Iron rocks. The west extreme of Surf islet, and the small islands near the south point of Shower island in line N.E. by N., leads through Alexandra passage, between North Iron, and Egg rocks.

**EGG ISLAND**, immediately fronting Smith sound, and standing boldly out from the coast, is the prominent landmark between Goletas channel and Fitz-Hugh sound. The island is 280 feet high, covered with trees, and is remarkable for its egg-like shape; it lies N.W.  $\frac{1}{4}$  N. 5 miles from cape Caution. From the south-west side of the island rocks extend about a cable and on the east side lies a small island, which is separated from Egg island by a narrow gully, giving the appearance of a split in the island itself, when seen from north or south.

**Egg rocks**, on the west side of Alexandra passage, are a cluster of rocks lying nearly three-quarters of a mile W.N.W. from North Iron rock, and S.S.E. about 2 cables from Egg island; these rocks extend about a quarter of a mile N.N.W. and S.S.E., the northernmost being 30 feet high.

**Denny rock**, a sunken danger on which the sea seldom breaks, and is a source of anxiety in thick weather, lies a quarter of a mile W.S.W. from the southernmost Egg rock. The west extreme of Ann island open west of Egg island bearing N. by E. leads about 3 cables west of Denny rock.

**SMITH SOUND** lies 6 miles N.N.W. from cape Caution; it is about 8 miles long N.E. and S.W., with an average breadth of  $3\frac{1}{2}$  miles; the entrance, between Jones, and Long points being  $5\frac{1}{2}$  miles across in a N.N.W. direction. At 6 miles within the entrance, on either side of a cluster of islands is a channel leading into Smith inlet. In almost every part of the sound the depths are over 40 fathoms, and there is generally a heavy swell.

The south-east shore of Smith sound, for a distance of 4 or 5 miles from the entrance, is fronted by several small islands and rocks having deep

water close-to; good shelter for boats will be obtained in a small cove about a quarter of a mile north of Jones point, the south entrance point of the sound, also in a cove one mile south of Jones point, abreast Egg rocks.

The entrance to the sound is protected by a plateau, on which stands a collection of islands, islets, and rocks; some above, and many under water, prominent amongst them being Egg and Table islands. Access to Smith sound may be had on either side of these islands.

**Alexandra passage.**—The south passage, is between Egg island and the south-eastern point of entrance; the narrowest part between Egg rocks and North Iron rock being 6 cables: here as elsewhere, however, the dangers are so steep-to that the *quickest* use of the lead is enjoined. A general leading mark through Alexandra passage (making allowance for heave of swell and tide), is, the west extreme of Surf island in line with the islets near the south point of Shower island bearing N.E. by N.

**Beaver passage.**—The northern channel into Smith sound, is between the islands fronting the north point of the sound, and Wood and White rocks, the northern and north-western extension of the above mentioned plateau. In Beaver passage the bottom is irregular, 20 fathoms being the least depth obtained. The course through the passage is E.  $\frac{1}{4}$  S., the east extreme of Search islands just open of the west end of Surf islet on that bearing, leads in midway between John reef (on south side) and False Egg island (on north side) where the width is 6 cables. This western entrance to the passage being the narrowest part; with the usual amount of sea or swell, good steerage, and vigilant attention are required.

**Table island**, the largest of the group of islands occupying the entrance to Smith sound, is about one mile long north and south, and half a mile broad, with the tops of the trees 120 feet above the sea, nearly flat. Table island when seen from abreast cape Caution makes with two summits.

A cluster of rocks, several of which are covered at low water, extend half a mile from the west side of Table island, having 24 fathoms water close to the outer rock.

**Ann island**, about half a mile in extent, is separated from the north end of Table island by a channel (a cable wide in some parts) in which shelter will be found for boats.

**CLUSTER REEFS**, consisting of several rocky heads and shoal patches, extend from Table island in a northerly and northwesterly

direction into the entrance of Smith sound. George rock, on which the sea breaks at low water, is the north-westernmost, and lies N. by W.  $\frac{3}{4}$  W. one mile from Ann island; Edward reef dries 7 feet, and lies E.N.E. three-quarters of a mile nearly from George rock. Wood rocks, which are awash at low water, situated E. by N. a quarter of a mile nearly from Edward reef, consist of three rocky heads, and are the north-easternmost of Cluster reefs. Bertie rock, with  $3\frac{1}{2}$  fathoms water, lies near the eastern edge of Cluster reefs; from the centre of this rock the north-west extreme of Ann island bears S.W.  $\frac{3}{4}$  S. distant nearly three-quarters of a mile.

The west extreme of False Egg island in line with Kelp head, bearing N.  $\frac{3}{4}$  W., leads to the westward; and Limit point, midway between Long and Shower islands, E. by N.  $\frac{3}{4}$  N., leads to the northward of Cluster reefs.

**White rocks**, 35 feet high, and very conspicuous, lie in the west entrance of Beaver passage, at  $3\frac{1}{4}$  miles N. by W.  $\frac{1}{4}$  W. from Egg island, and nearly one mile north-west of Cluster reefs.

**John reef**.—At 3 cables N.N.W.  $\frac{3}{4}$  W. from White rocks and 6 cables S. by W.  $\frac{3}{4}$  W. from False Egg island, lies John reef, which dries 3 feet at low water, with 9 to 20 fathoms close around; forming the north-western danger, on the south side of Beaver passage.

**Leading mark**.—The east extreme of Search islands just open south of the west end of Surf islet (east side of Smith sound) bearing E.  $\frac{1}{3}$  S., will lead 3 cables to the northward of John reef, and into Smith sound through Beaver passage.

**FALSE EGG ISLAND**, resembling Egg island in shape, but smaller, is 150 feet high, it lies on the north side of Beaver passage, and is the outlying landmark for this northern entrance to Smith sound.

**James rock**.—At about 3 cables W.  $\frac{1}{4}$  N. from False Egg island lies James rock, the exact position of which is somewhat doubtful; the sea breaks on this rock at low water, and between it and False Egg island the bottom is foul.

**Clearing mark**.—The west part of the large Canoe rock bearing North, or in line with Quoin hill (on Penrose island) passes three-quarters of a mile westward of James and John rocks, and leads clear westward of all dangers at the entrance of Smith sound.

**LONG POINT**, the north-west point of Smith sound, lies E. by N. three-quarters of a mile from False Egg island; Tie island, which is nearly a quarter of a mile in extent, lies close westward of Long point, and is separated from it by a boat passage, in which there is a depth of 4 fathoms; Ada rock, which is awash at low water, lies S.S.E.  $\frac{1}{2}$  E. 2 cables from Tie island.



**Browne island**, on the north-east side of Beaver passage, lies S.E.  $\frac{1}{2}$  S. half a mile from Long point; the island is 250 feet high, nearly half a mile long N.N.W. and S.S.E., and a quarter of a mile broad, with 17 to 23 fathoms close to its south point. Between the south part of Browne island and Wood rocks, the eastern part of Beaver passage is 8 cables across with depths of 30 and 40 fathoms.

**Surprise patch**, on the north side of Smith sound, lies N.E. by E.  $\frac{1}{4}$  E.  $1\frac{3}{4}$  miles from the south extreme of Browne island; there is a depth of 5 fathoms on this patch, 7 to 17 fathoms close around, and no bottom at 40 fathoms 2 cables to the northward.

**Judd rock**, with less than 6 feet water, lies N.E. by E.  $\frac{1}{4}$  E. three-quarters of a mile from Surprise patch, and W. by N. three-quarters of a mile from Long island, the largest of the Barrier islands; there is no bottom at 40 fathoms in the vicinity of this rock.

**Barrier islands**, at the head of Smith sound, consist of two large and several small islands covering a space of about 5 miles in extent N.E. and S.W. Blakeney passage on the north, and Browning passage on the south side of these islands and leading to Smith inlet, are each about one mile wide, with no bottom at a depth of 40 fathoms.

**TAKUSH HARBOUR**, on the south shore of Smith sound,  $\frac{3}{4}$  miles within the entrance, and  $1\frac{1}{4}$  miles east of Barrier islands, is 2 miles long, north-east and south-west, and one mile broad. This is the only anchorage which a ship can resort to for shelter when crossing Queen Charlotte sound. Vessels of large size can lie secure here.

The entrance is three-quarters of a mile wide, with no bottom at 39 fathoms, decreasing to 22 fathoms, rock, in the centre of Ship passage, which is  $2\frac{1}{2}$  cables wide, and is formed by Gnarled islands on the west, and Fish rocks (dry 3 feet at low water) on the east side.\*

**Petrel shoal**, with 15 feet water, situated one cable S.S.E.  $\frac{3}{4}$  E. from the easternmost Gnarled island, is the principal danger in rounding into Anchor bight.

**Fly basin**, at the head of Takush harbour, perfectly land-locked, is about one mile long E.N.E. and W.S.W., and one to 2 cables broad, with  $2\frac{1}{2}$  to 3 fathoms in the western and 6 to 8 fathoms in the eastern part of the basin. The entrance to Fly basin, which is about one cable wide, is contracted to a quarter of a cable by a shoal extending from the east entrance point, with a rock (dry 2 feet at low water), and a patch of 9 feet on its western edge; between this shoal and the west entrance point there is a depth of 9 fathoms. If required a small vessel could be taken into Fly basin.

\* See Admiralty plan:—Takush harbour, on sheet Approaches to Fitz-Hugh and Smith sounds, No. 2,448; scale  $m = 1\cdot0$  inch.

**Anchorage** in Takush harbour will be found in 10 or 11 fathoms, mud, in Anchor bight, midway between Ship rock and Steep point, with the north extreme of Bull point bearing N.E. by E.  $\frac{3}{4}$  E., and east extreme of Bloxham point N. by E.  $\frac{1}{2}$  E.

**Tides.**—It is high water, full and change, in Takush harbour at 1h. 0m. ; springs rise 14 feet, neaps 11 feet.

**Directions.**—When bound to Takush harbour, it is recommended to pass through Browning passage, and, after passing North point keep the north extreme of Bright island a little open north of that point bearing W. by S.  $\frac{1}{4}$  S., until Berry point (south side of Fly basin) appears midway between the entrance points of Fly basin, S.E., which will lead through Ship passage; and when Steep point is well open of the southernmost Gnarled island bearing W.S.W. a course may be steered for the anchorage in Anchor bight, taking care to avoid the shoal ground south of Gnarled island, passing midway between Anchor and Gnarled islands. Good steerage is required here, speed should be proportionately slow, the leads kept quickly going, and the water not shoaled to less than 7 fathoms.

**SMITH INLET** (Quas-cillah), the continuation of Smith sound, is about 3 miles wide at its entrance, between eastern part of Takush harbour and Dsoolish bay; it is said to extend nearly 25 miles in an E.N.E. direction. The inlet has not been surveyed.

**FITZ-HUGH SOUND**, the entrance to which lies 5 miles northward of Smith sound, is 39 miles long in a general N.N.W. and S.S.E. direction, having an average breadth of 3 miles, with no known hidden dangers throughout. The southern entrance to Fitz-Hugh sound lies between Cranstown point, the south entrance point. Fitz-Hugh sound and of Rivers inlet, and cape Calvert the southern extremity of Calvert island at 5 miles W.  $\frac{1}{2}$  N. from it.

The coast from Long point extends N.W. by N.  $2\frac{1}{4}$  miles to Kelp point, from which Cranstown point bears N. by W. distant one mile.

The sound at 4 miles north of Safety cove is contracted to  $1\frac{1}{2}$  miles by Addenbrooke and adjacent islands, which lie on the east side; the shores on both sides are, however, steep-to, and the depths in the channel from 80 to 140 fathoms.

**Canoe, Spur, and Paddle rocks** lie about a mile off Kelp point, and occupy a space of  $1\frac{1}{2}$  miles in a N.N.W. and S.S.E. direction. The space thus enclosed being foul, and more or less covered with growing kelp. Canoe rock, the centre and most prominent of these rocks, is bare, 25 feet high, and stands boldly out from the coast, making a good point for identification.

**Open bay**, on the north-east side of Cranstown point, affords anchorage in 7 fathoms, about 2 cables from the shore during summer or with off-shore winds, but there is generally a swell in the bay, and it is only used by local craft as a temporary anchorage.

**Cape Calvert**, the south extreme of Calvert island, is the southern termination of Cape range (2,000 feet high). At 2 miles north of the cape lies Entry cone (1,200 feet high), which is conspicuous, and forms a good mark for recognising Fitz-Hugh sound from the southward, and westward; cape Calvert is fronted by the Sorrow islands, which are steep-to, of granite formation, and covered with gnarled and stunted trees; between these islands and the cape fair shelter may be found for boats in Grief bay (Telakwas), but during south-east or south-west gales, a swell is more or less experienced, rendering landing difficult and sometimes dangerous. An Indian resort when travelling, or engaged in hunting the sea otter.

**Directions.**—To enter Fitz-Hugh sound from the southward, after passing cape James (Shadwell passage) a N.N.W.  $\frac{3}{4}$  W. course should be steered (or for Entry peak 1,200 feet high the south conical mountain over cape Calvert) until past the Storm islands; when, Addenbrooke island open of, and the east shore of Fitz-Hugh sound (beyond) shut in by, cape Calvert bearing N.N.W.  $\frac{1}{4}$  W., will lead midway between Channel reef and Egg island, and up to the entrance of Fitz-Hugh sound. Allowance should be made for tidal streams: the flood sets to the eastward into Queen Charlotte and Smith sounds with a velocity at springs of nearly 2 knots.

**From the westward.**—Vessels from the westward, bound for Fitz-Hugh sound, should use North passage, between Sea Otter group and Calvert island; this passage is about 3 miles wide, with depths of 39 to 71 fathoms; Hedley patch with 9 fathoms water (*probably less*) lies in the west entrance to North passage, at  $3\frac{1}{2}$  miles N.  $\frac{1}{2}$  W. from Watch rock. (See description of Sea Otter group, p. 3.)

**SCHOONER RETPEAT\*** (Ka-pi-lish), east side of Fitz-Hugh sound, is the name given to the anchorages among a cluster of islands at the south-west end of Penrose island, which here separates Fitz-Hugh sound from Rivers inlet. The Retreat affords a secure stopping place, and with care may be safely entered by steam vessels.

**Joachim island**, the south-easternmost and largest of this cluster of islands is 400 feet high,  $1\frac{1}{4}$  miles long north and south, with an average

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\* See Admiralty plan:—Schooner retreat on sheet of plans of anchorages between cape Caution and Ogden channel, No. 1,901.

breadth of half a mile ; the north extreme of this island is separated from Penrose island by a boat passage.

**Ironside island**, the eastern part of which is 200 feet high, is the next in size, and is separated from Sea bluff, the north-west point of Joachim island, by the channel into Schooner retreat.

**Safe entrance**, between Joachim and Ironside islands, three-quarters of a mile wide, has in the middle from 8 to 17 fathoms water ; on the west side of Safe entrance lies a rock awash, about 50 yards from Grey islands, having a shoal extending  $1\frac{1}{2}$  cables in a northerly direction, with 2 to 3 fathoms on it, and 4 to 10 fathoms close-to.

**Comber rock**, on which the sea often breaks, is an outlying danger at the north side of the entrance of Schooner retreat ; the rock covers at three-quarters flood, and lies S. by W. three-quarters of a cable from Surf point, the south-west extreme of Ironside island.

**Frigate bay**, the southernmost anchorage in Schooner retreat, is a space about half a mile long north-east and south-west, and a quarter of a mile broad, with depths of 9 to 20 fathoms ; it is bounded on the south by Joachim island, and on the west by Ironside and Maze islands. The best anchorage in this bay will be found just within Safe entrance, off a clean sandy beach, in 13 fathoms water, with the north-east extreme of Ironside island bearing W.  $\frac{1}{2}$  S., and the north-west extreme of Sea bluff S.  $\frac{1}{4}$  W. It is necessary to moor in this bay.

**Maze islands** are a cluster of small islands on an extensive shoal projecting in a northerly direction from the north-east end of Ironside island ; the north-east prong of this shoal extends nearly across to Penrose island, having a narrow channel with  $5\frac{1}{2}$  to 9 fathoms water, which leads from Frigate bay to Secure anchorage.

**Secure anchorage**, north-west of Frigate bay, is about a quarter of a mile long north-east and south-west, and  $1\frac{1}{2}$  cables broad, with depths of 9 to 11 fathoms ; it is protected from seaward by Ironside, Bird, and Highway islands. Verney passage, leading to Secure anchorage from the westward, between Ironside and Bird islands, is nearly half a cable wide with 7 fathoms water in mid-channel, but it is contracted to about 30 yards by the shoals on either side, and having Chance rock at the entrance is only suitable for small coasting vessels.

**Gales.**—During S.E. and S.W. gales the gusts are furious, but with good ground tackle and care there need be no danger in Schooner retreat.

**Tides.**—It is high water, full and change, in Schooner retreat at Oh. 30m. ; springs rise 14 feet, neaps 11 feet.

**Directions.**—Vessels bound to Schooner retreat should at all times use Safe entrance ; from the southward, Quoin hill (880 feet high) at the

## 12 QUEEN CHARLOTTE SOUND TO SEAFORTH CHANNEL. [CHAP. I.]

west part of Penrose island, should be brought in line with the hill 200 feet high, on the east end of Ironside island bearing N.N.E., this will lead to abreast Karlslake point, the west extreme of Joachim island, when Safe entrance will be open. After passing Karlslake point steer very carefully and proceed at a moderate speed towards Bluff point until Quoin hill is in line with Centre island bearing N.  $\frac{3}{4}$  E., which will lead through Safe entrance in mid-channel, and to the anchorage in Frigate bay.

The soundings between Karlslake point and Safe entrance are irregular, varying from 24 and 30 fathoms abreast the point, to 40 fathoms no bottom within 2 cables of the entrance, thence decreasing gradually to 15 and 20 fathoms midway between Sea bluff and the southern Grey island.

**SAFETY COVE\*** (Oat-so-alis), on the west shore of Fitz-Hugh sound and 7 miles to the northward of cape Calvert, is about one mile long W.S.W. and E.N.E., and nearly half a mile wide at its entrance, to the westward of which the shores of the cove extend parallel to each other at a distance of 2 cables apart; there are depths of 9 to 17 fathoms within half a cable of the shores, and 14 to 19 fathoms, soft mud, in the middle of the cove, but the head is filled by a shoal extending out 3 cables, with 7 fathoms close to its edge. The north entrance point of Safety cove has two small islets lying off it, which are useful in identifying the entrance, especially when coming from the northward.

**Anchorage.**—Good anchorage will be obtained in 13 fathoms, mud, in the middle of Safety cove abreast a waterfall on the north shore. Entering at night, a vessel should keep in the middle of the cove, obtaining soundings, and anchor as soon as 17 fathoms are struck. During south-east or south-west gales, strong gusts blow across the valley at the head of this cove.

**Fresh water.**—The stream which runs into the head of Safety cove affords excellent water, but is difficult to obtain by boats. The waterfall on the north shore, unless in exceptionally dry weather (August and September), will afford a good supply.

**Tides.**—It is high water, full and change, in Safety cove, at 1h. 0m.; springs rise 14 feet, neaps 11 feet.

**Observation spot** on the north shore, about  $1\frac{1}{2}$  cables westward of the waterfall, is in lat.  $51^{\circ} 31' 49''$  N., long.  $127^{\circ} 56' 23''$  W., depending upon Shell island, Beaver harbour, being in  $127^{\circ} 25' 7''$  W.

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\* See Admiralty plan :—Safety cove, on sheet of plans of anchorages between cape Caution and Ogden channel, No. 1,901; scale,  $m = 6 \cdot 0$  inches.

**Kwakshua passage**,  $7\frac{1}{2}$  miles north of Safety cove, leads to the sea, and lies between Calvert and Hecate islands; this passage is only partially examined; it has, however, been used by coasting vessels. (See page 95.)

**Hakai channel**,  $5\frac{1}{2}$  miles north of Kwakshua, is an unexplored channel leading to sea. (See page 95.)

**Goldstream harbour**,\* at the south-east entrance point of Hakai channel, affords good accommodation for small vessels; it is about 2 cables long north and south, and 2 cables broad, with depths of 7 to 15 fathoms, sand and mud. The entrance to this harbour from Fitz-Hugh sound is through an intricate passage little over half a cable wide, between the north extreme of Hecate island which forms the south shore, and an island about one mile in extent which forms the north side of Goldstream harbour. Evening rock, which dries 3 feet at low water springs, lies near the middle of the passage about 2 cables within the entrance; it would, therefore, be advisable in the absence of good local knowledge, to place a boat near this rock (when covered) before entering or leaving the harbour, and proceeding at slow speed, keep in mid-channel, where there is a general depth of 6 fathoms.

**Tides**.—It is high water, full and change, in Goldstream harbour at 1h. 0m.; springs rise 15 feet, neaps 12 feet.

**Nalau passage**, 4 miles north-westward of Hakai, is an unexplored channel leading to sea. (See page 97).

**Namu harbour**,† at the south entrance of Burke channel, and one mile south of Edmund point, east side of Fitz-Hugh sound, lies N.E. by N. 6 miles from Nalau passage. It is three-quarters of a mile long, E.N.E. and W.S.W., and three-quarters of a mile broad, with depths of 20 to 28 fathoms; in the entrance of the harbour lies Kiwash, a round island, 200 feet high, a quarter of a mile in diameter, and covered with trees. South passage, between Kiwash and Plover island (150 feet high), which forms the south entrance point of Namu harbour, is nearly half a mile wide, with 23 to 28 fathoms water; North passage, between Kiwash and Cliff island, on the northern side of the harbour, is 3 cables wide with 35 to 18 fathoms water. Namu harbour may be entered either by North or South passage.

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\* See Admiralty plan:—Goldstream harbour, on sheet of plans of anchorages between Cape Caution and Ogden channel, No. 1,901; scale,  $m = 6.0$  inches.

† See Admiralty plan:—Namu harbour on sheet of plans of anchorages between Cape Caution and Ogden channel, No. 1,901; scale,  $m = 4.0$  inches.

**Anchorage.**—Large vessels should anchor in 20 fathoms, in the centre of Namu harbour, with the north extreme of Kiwash island bearing West, and the west extreme of Plover island S. by E. Small vessels may anchor in Whirlwind bay on the east side of Namu harbour in 12 fathoms, clay, with the north extreme of Kiwash island bearing W. by S., and the centre of Clam island (a small island south of the bay) South. During the autumn and winter months the anchorage in Whirlwind bay is not recommended, as the williwaws blow with furious strength over the mountains (3,000 feet high) in its vicinity. This anchorage is moreover confined by Loo rock with 3 feet water, lying nearly in the middle of the bay, and E. by N.  $\frac{1}{4}$  N. 2 cables from the south extreme of Sunday island.

There is a large stream and an old Indian camp in Whirlwind bay.

**Burke channel**, on the east side of Fitz-Hugh sound, 3 miles northward of Namu harbour, leads to Bela-Kula anchorage at the head of North Bentinck arm, a distance of 55 miles in a general north-easterly direction, from its junction with Fitz-Hugh sound.

**Bentinck arm.**—See page 19.

**Edmund point**, the south entrance point of Burke channel, has several small islands near it; and Walker point, the north entrance point to the channel, is formed by an island situated 2 miles north-west from Edmund point; this island is steep-to, but at a distance of 2 cables the water is not deeper than 26 fathoms, mud bottom, deepening quickly a short distance further, a position which might be used in a fog for anchoring.

Temporary anchorage, north of Walker point, might on emergency with care, and sending a boat ahead, be taken up, but there are many covering reefs.

**Kiltik**, on the west side of Fitz-Hugh sound, opposite Edmund point, is a narrow creek (less than 2 cables), extending nearly a mile in a westerly direction, with an average depth of 20 fathoms in the centre, but shoal for one third of a mile from its head. This creek it is supposed might be used by moderate sized vessels; but was not examined in detail.

**Fog rocks**, situated rather on the east side of Fitz-Hugh sound and 3 miles north of Walker point, consist of six rocks above water, the highest of which is 25 feet high, with a few shrubs on it. These rocks (which appear nearly in mid-channel from the southward) may be passed on either side at a distance of 9 cables, but the main route lies to the westward of them; there is a depth of 103 fathoms, mud, between Fog rocks and the eastern shore of Fitz-Hugh sound.

**Port John.**—At 4 miles north of Lama passage, on the eastern shore of Fisher channel, and 8 miles northward of Fog rocks, is an indentation

with port John in its northern part, immediately under Remarkable cone mountain and terminating in Evans arm to the southward.

Port John (of Vancouver) affords anchorage in 20 fathoms, but is much confined by Mark rock nearly in the middle of the place, and by the flat extending off the stream at the head. There is also anchorage at the head of Evans arm in 20 fathoms, which may be reached through South passage, but the immediate approach to it north of Boot island is foul, and a vessel of size should be preceded by a boat. North passage should only be used after temporarily buoying Peril rock.

**LAMA PASSAGE** \* is the main passage connecting Fisher channel (which is the northern continuation of Fitz-Hugh sound) with Seaforth channel and Milbank sound; its eastern entrance on the west side of Fisher channel and 6 miles north of Fog rocks may be recognised by a conical mountain 1,000 feet high, on the north-east point of Hunter island, and by Pointer island, on the south side of this entrance where it is nearly a mile wide. Thence the passage trends west 2 miles to abreast Serpent point on the south shore, the breadth being about half a mile, and the soundings 130 fathoms in the middle, 25 and 26 fathoms near the shores, it then widens and trends W.S.W. 4 miles to abreast Twilight point (the south-west point of Denny island) with no bottom at 38 fathoms near the north shore, and 23, 12, and 20 fathoms close to the points extending from the south shore.

The entrance to Plumper channel (*see* page 98), which is a mile wide, lies opposite Twilight point, from which Lama passage turns to the north-west for 4 miles to Grave point, which has several Indian graves on it; from  $2\frac{1}{2}$  miles north of Twilight point to Grave point the passage is contracted to 2 cables, with uniform depths of 25 to 30 fathoms.

**Cooper inlet**, situated on the southern shore of Lama passage, 5 miles from the eastern entrance, is deep and contains several small creeks and rocks; but in fine weather anchorage may be obtained in 14 fathoms water under Westminster point, its north-west point, by bringing it to bear W.N.W., and Harbourmaster point its north-east point, just open of the reefs off Charles point N.E. by E.  $\frac{3}{4}$  E.

Jane creek, in the south-east corner of Cooper inlet, may be used by small vessels. Charles point, its north point, has two reefs extending one cable from it in a north-westerly direction, the outer of which dries 9 feet. Good anchorage may be had in this creek in 9 fathoms water, with Charles point in line with the east point of Canoe bight (on the opposite shore of

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\* *See* Admiralty chart :—Lama passage and Seaforth channel, No. 2,449; scale  $m = 1.55$  inches.



the passage) bearing N.W.  $\frac{1}{4}$  W., and George point, the south entrance point of Jane creek, S.W. by W. Large vessels may anchor in about 18 fathoms midway between Charles and George points; the bottom in this creek is generally rocky.

**Camp point**, at the south-west extremity of Denny island, and the turning point into Lama passage, should not be rounded nearer than half a mile, as the bottom is foul for a distance of 3 cables, with patches that uncover 2 feet at low water springs.

**McLaughlin bay**,\* on the west shore of Lama passage, half a mile south of Grave point, is a good stopping place; it is about 4 cables wide and  $1\frac{1}{2}$  cables deep, with 8 to 14 fathoms water. The south point of the bay has a bare summit 150 feet high, which in thick weather is an useful guide to a stranger. The anchorage is in 11 fathoms off the centre of the beach about a cable from the shore, with Grave point open east of south-west point of Narrow island bearing N.  $\frac{1}{4}$  W., and Archibald point open east of Napier point S.E. by E.

In this bay† is the site of an old Hudson bay trading post, which in 1868 was again used as such, the Bella Bella natives simultaneously migrating here from Bella Bella islands; there is a small quantity of cleared ground at the foot of a rocky hill 200 feet high, a quarter of a mile from the beach, on the west side of which there is a lake.‡

**BELLA BELLA ISLANDS** lie three-quarters of a mile north of Grave point, bare and about 15 feet high; these islands were until recently, inhabited during the summer months by the Indians of the formerly powerful Bella Bella tribe, numbering now however only (1867) about 45. Temporary anchorage may be had to the eastward of Bella Bella islands, off a green bushy flat, the old winter residence of these natives.

**KLICK-TSO-ATLI HARBOUR**, on the north side of Denny island, and  $1\frac{1}{2}$  miles east of Bella Bella islands, is about a mile in extent, with depths of 2 to 13 fathoms, and affords excellent shelter for vessels of any size. Harbour island, off the north-west point of Klick-tso-atli, has a reef extending one cable from its east end.

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\* See Admiralty plan:—McLaughlin bay, on sheet of plans of anchorages between cape Caution and Ogden channel, No. 1,901; scale,  $m=5\cdot5$  inches.

† This is the only Indian winter residence between Queen Charlotte sound and Seaforth channel.

‡ A rock is said, from Indian report, to exist in Lama passage abreast McLaughlin bay, and to lie half a cable from the eastern shore, with Napier point bearing S.S.E. distant nearly 6 cables; this reported danger may be avoided by keeping in mid-channel.

—H.M.S. *Amethyst*, 1876.

**Steamer passage.**—The channel south of Harbour island is one cable wide, with a depth of 7 fathoms, and is suitable for small vessels ;\* large vessels are recommended to pass north of Harbour island and through Wheelock pass, which lies between a 3-fathom patch near the centre of the channel and Noble point, the north-east entrance point of the harbour, off which a 3-fathom shoal extends three-quarters of a cable in a south-westerly direction.

The west extreme of Cypress island in line with the east extreme of Meadow island bearing N.N.W.  $\frac{3}{4}$  W. leads through Wheelock pass in 11 to 19 fathoms water, and when Harbour island bears West a vessel may anchor in 12 fathoms.

If in a large vessel and not wishing to enter Klick-tso-atli harbour, secure anchorage may be obtained in 15 fathoms, with Harbour island bearing S.S.E.  $\frac{1}{4}$  E. distant 3 cables.

**Ka-Koosh-dish creek**, just north of Noble point, is suitable for small craft, but is barred across by kelp, having  $3\frac{1}{2}$  fathoms.

**Main passage**, leading from Lama passage to Seaforth channel, between the north-east extreme of Campbell, and Narrow islands, is three-quarters of a mile long N.N.E. and S.S.W., and from 2 to  $2\frac{3}{4}$  cables wide, with depths of 20 to 30 fathoms in it. Care should be taken to maintain a mid channel course.

**Narrow island**, situated about three-quarters of a mile north of Bella Bella islands, is three-quarters of a mile long E.N.E. and W.S.W., and nearly half a mile broad ; there is a ledge of rocks awash at high water, with 5 fathoms close to, at one cable from the south side of Narrow island.

**Pole, and Tree islets**, situated about a quarter of a mile from the west extreme of Narrow island, are two small islets 2 cables apart in a north and south direction from each other ; Tree islet the northernmost is 120 feet high, with a detached rock close to its north-east side. There are two rocky ledges between these islets and Narrow island.

**Hodges reef**, which dries 2 feet at low-water springs, with 6 and 7 fathoms close-to, lies nearly in mid-channel between Tree islet, and Deer island at 4 cables east of it. From this reef the centre of Tree islet bears East 2 cables, and the east extreme of Pole islet S.W.  $\frac{3}{4}$  S. 3 cables.

**Gunboat passage** between Denny and Cunningham islands, is narrow and intricate, containing many rocks and kelp patches. From its western entrance it trends about E. by N. 6 miles, thence North 2 miles

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\* This passage was frequently used by the *Beaver* during the survey.

## 18 QUEEN CHARLOTTE SOUND TO SEAFORTH CHANNEL. [CHAP. I.]

to its eastern entrance, which is at the junction of Fisher and Deane channels.

Gunboat passage should not be attempted unless in small handy steam coasting vessels with good local knowledge.

**SEAFORTH CHANNEL**, the main channel connecting Lama passage with Milbank sound : is 14 miles long E. by N. and W. by S. with an average breadth of one mile ; the land on both sides is much broken by islands with channels between leading north and south ; the water is generally deep, and with the Admiralty charts there should be no difficulty in navigating, in ordinary weather.

**Kynumpt harbour**,\* on the south shore of Seaforth channel, and about 2 miles westward from its junction with Lama passage, may be recognised by Grassy islet 20 feet high, and Regatta reefs, both of which are conspicuous, lying in the middle of the channel  $1\frac{1}{4}$  miles eastward of the harbour, also by White stone a conspicuous bare rock 12 feet high lying 2 cables west of Kynumpt. This harbour is 4 cables long N.N.W. and S.S.E., and averaging 2 cables in breadth with 6 to 16 fathoms, mud ; the best anchorage is in 7 to 9 fathoms with the north extreme of Berry point bearing E.N.E., and the west extreme of Low island N.N.E.†

**Tides.**—It is high water, full and change, at Kynumpt at 0 h. 30 m. ; springs rise 14 feet, neaps 11 feet.

**Observation spot** on Berry point, is in lat.  $52^{\circ} 12' 20''$  N., long.  $128^{\circ} 11' 37''$  W., considering Shell island, Beaver harbour, to be in  $127^{\circ} 25' 7''$  W.

**Dall patch** with less than 6 feet water lies half a mile N.N.E. from the entrance to Kynumpt harbour ; from the centre of the patch Defeat point bears S.  $\frac{1}{2}$  W., distant  $3\frac{1}{2}$  cables, White stone S.W. by W. ; and west extreme of Low island S. by W. ; a shoal of 3 fathoms extends  $1\frac{1}{2}$  cables to the westward of Dall patch.

To avoid Dall patch, it is recommended to keep the southern shore on board, which in this vicinity may be approached to within  $1\frac{1}{2}$  cables. Or, if wishing to go northward of the patch :—Grassy islet, in line with the south extreme of Handyside island bearing E.  $\frac{3}{4}$  N. leads nearly midway between Dall patch and Regatta reef.

**Cod bank** with 27 fathoms, sand, lies in the middle of the western entrance to Seaforth channel, N. by W.  $1\frac{1}{2}$  miles from Sound point

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\* See Admiralty plan :—Kynumpt harbour, on sheet No. 1,901 ; scale,  $m = 5\frac{1}{2}$  inches.

† A rock with 10 feet water is reported to lie S.W. distant 2 cables from Low island.

the south-west entrance point to Seaforth channel; there are 58 fathoms on the south side and 163 fathoms, rock, close-to on the north side of Cod bank.

**Anchorage.**—Between Sound point, and Gale creek at  $2\frac{1}{2}$  miles to the eastward of it, a bank extends about three-quarters of a cable from the south shore of Seaforth channel; on its outer edge—which is steep-to—there are depths of 28 and 30 fathoms, decreasing to 18 and 10 fathoms close to the shore for a distance of one mile east of Sound point. Thence to Gale creek, reefs with 9 fathoms close-to extend about 3 cables from the shore. During foggy weather, temporary anchorage may, with careful use of the lead, be obtained on this bank.

#### BENTINCK ARM.

**BURKE CHANNEL** and **BENTINCK ARM**, though not surveyed in detail, have been frequently traversed (both by day and night), and may be safely navigated by the Admiralty chart, there being no known detached dangers.

**Anchorage.**—In Restoration cove, distant 12 miles from Fitzhugh sound on the east shore, a vessel may anchor in 20 fathoms, 2 cables off the beach, but the shore should be approached very slowly, as it is steep-to.

At **Belakula**\* (head of North Bentinck arm), vessels anchor close to the mud flat at the mouth of the river on the south side. In taking up a berth, great care is required; the deep sea lead should be used, and a leadsman on the dolphin striker will guard against getting too near the edge of the flat, which is quite steep-to. A large vessel should moor in 45 to 50 fathoms; a stern anchor may also be required, or a hawser laid out to the shore will be useful for keeping the hawse clear. Small vessels may find shelter during summer, on the north shore under Custom house point.

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\* See Admiralty chart, cape Caution to port Simpson, No. 1,923b; and plan of Belakula anchorage on sheet of plans No. 1,462.

## CHAPTER II.

## MILBANK SOUND TO CHATHAM SOUND.

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 VARIATION IN 1883.

 Milbank sound, 25° 30' F.     |     Chatham sound, 26° 10' E.
 

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**MILBANK SOUND**, has its entrance between the parallels of 52° 9' and 52° 16' N., and the meridians of 128° 33' and 128° 42' W. This spacious sheet of water connects Hecate strait with Seaforth, Finlayson, and Mathieson channels.\*

At its western entrance between cape Swain and Day point, the sound is nearly 9 miles wide, which breadth it maintains in a N.N.E. direction for 5 miles, thence it trends more northerly, and takes a N.N.W. direction for 10 miles, until meeting Finlayson channel.

**Landmarks.**—Approaching Milbank sound from the south-westward, Helmet peak on Lake island, at the eastern shore of the sound, is conspicuous. This remarkable peak is 1,032 feet high, and bears a striking resemblance to a helmet, with the sloping side towards the west.

Stripe mountain, on the north side of Dowager island, at the entrance of Finlayson channel, is 2,020 feet high, with a remarkable landslip down its south-west side.

—Nearing the sound the low wooded shores of cape Swain should be recognised. This cape forms the south-west entrance point of the sound. The shore northward of it is much broken, and the tops of the trees are about 120 feet high.

Day point, the north-west entrance point of Milbank sound, has a group of wooded islets, rocks awash at high water, and sunken rocks extending S.S.W. 2 miles from it; the western island of the group (Outer island) being round, wooded, and conspicuous. The outer edge of these dangers,

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\* See Admiralty charts:—Cape Caution to port Simpson, northern and southern portions, No. 1923 A and B; scale,  $m=0\cdot25$  of an inch.

lies S.S.W., distant  $2\frac{1}{6}$  miles from Day point, and S.E.  $\frac{1}{2}$  S. distant 8 cables from Outer island.\*

**White rocks.**—About 5 miles within the sound lie the White rocks (Ka-mas-ik). The southern of these two bare rocks is 50 feet high; and N. by E., distant half a mile from it lies a smaller rock 6 feet above high water. Both rocks are conspicuous, and lying well out in the sound, show out against the dark background of pine and cedar, which line the shores of Milbank sound.

**Discovery rocks**, situated off cape Swain, are two dangerous rocks lying N. by E. and S. by W. from each other, distant 8 cables. The southern danger, over which the sea seldom breaks, lies W.  $\frac{3}{4}$  S., distant one mile from cape Swain. The northern rock, which usually indicates itself by breakers, lies N.W.  $\frac{1}{4}$  W. distant one mile from cape Swain.

**West rock**, situated on the eastern shore of the sound, is of small extent, 8 feet above high water, and lies S.W.  $\frac{1}{4}$  S., distant 5 cables from Sound point.

Several patches which uncover at low water lie between Sound point and West rock.

**Mouse rock** is a dangerous sunken rock over which the sea generally breaks, it lies at the north-west entrance of Seaforth channel, W.  $\frac{1}{2}$  N. distant 6 cables from Surf point.

Bush point (north side of Seaforth channel) seen just open south of Surf point, bearing E. by N.  $\frac{1}{2}$  N. leads southward, and Helmet peak seen just open of the west extreme of Mary island, bearing N.  $\frac{3}{4}$  E. leads westward of Mouse rock.

**Sound rock**, over which the sea only breaks in bad weather, has 12 feet water on it, and lies S. by E.  $\frac{3}{4}$  E. distant 5 cables from the northern White rock (Bare rock), and E.  $\frac{1}{2}$  N., distant  $2\frac{1}{2}$  cables from the southern and highest White rock.

There are depths of 50 fathoms, rock, at one mile eastward, and 34 fathoms close-to, westward of Sound rock.

The south extreme of Cliff island, seen just open of Boulder head, bearing N.N.W.  $\frac{1}{2}$  W., leads 8 cables eastward of Sound rock.

**Vancouver rock**, a dangerous rock which uncovers 12 feet at low water, is steep-to on all sides; there being depths of 13 and 14 fathoms within a cable of the rock. When visible this rock presents the appearance of a large whale, and is conspicuous.

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\* Kelp will be seen on the surface of the water growing on nearly every danger with a bottom of rock or stones during the summer and autumn months; but during the winter and spring this useful marine plant is absent.

It lies N.N.W.  $\frac{1}{4}$  W., distant 4 miles from White rock, and N.W. by W.  $\frac{1}{2}$  W. distant  $1\frac{1}{2}$  miles from Boulder head, and S.S.W.  $\frac{1}{4}$  W. distant one mile from Cliff island.

Cross point (south-east extreme of Lady island), in line with Boulder head, bearing E.  $\frac{3}{4}$  S., leads 6 cables southward; and Low point seen just open westward of the North island group, bearing North, leads westward of Vancouver rock.

**Cross ledge** extends 8 cables to the southward of Cross point, and partially uncovers. There is a depth of 20 fathoms close southward of Cross ledge.

Surf point bearing E. by S. leads southward of Cross ledge, in mid-channel between Cross point and White rock.

**Boulder ledge**, of sunken rocks, with depths of  $1\frac{1}{2}$  and 5 fathoms, extends 9 cables in a south-easterly direction from Boulder point.

**Boulder bank**, with 18 fathoms, rock, lies S.S.W., distant 7 cables from Boulder point.

Surf point, bearing E. by S., leads southward of the dangers off Boulder point.

**North ledges**, which uncover at low water, lie northward of the North island group. The north extreme of these ledges lies N. by W.  $\frac{1}{2}$  W., distant 6 cables from North island; and the south extreme 2 cables N.E. of that island.

**Beaver bank**, has 27 fathoms water (least depth found) on it, over a bottom of sand and shells. The centre of this bank lies W. by N., distant  $2\frac{2}{10}$  miles from Low point.

The bank is about one mile long in a North and South direction, with depths of 45 fathoms, gravel, at 2 cables westward, and 114 fathoms, rock, at one mile eastward of the bank in mid-channel between Low and Jorkins points.

**Fogs.**—A vessel meeting with a fog in this portion of Milbank sound would find Beaver bank of service not only as indicating her position, but as affording temporary anchorage.

**Sandstone reef** situated close to the shore in the north-western portion of Milbank sound, is a conspicuous narrow ridge, of sandstone formation, about one mile long in an E. by N. and W. by S. direction. The highest portion of this ridge is 4 feet above high water.

The western extreme of Sandstone reef lies 5 cables from the shore of Swindle island, and  $1\frac{1}{2}$  miles from the eastern side of Price island.

**Soundings.**—A channel 8 miles broad, with depths of over 100 fathoms, mud, extends south-westward of Milbank sound. North-westward

of this channel the depths decrease to 50 fathoms, and less, at the mouth of Laredo sound, with a bottom of fine sand. South-eastward the depths are 76 and 80 fathoms, with a bottom consisting of sand, mud, and rock at intervals.

In thick weather, therefore, or if overtaken by fog, when approaching Milbank sound from the south-westward, with average precautions, a vessel's position should be indicated by the deep sea lead.

Within Milbank sound the water is deep, there being depths of 109 and 116 fathoms within its entrance points, the deeper water being on the south-east shores of the sound. In mid-channel there is no bottom at 130 fathoms, and at one mile from the south-east shores of the sound there are depths of 110 and 120 fathoms, rock; those shores, therefore, should be approached with caution.

In the northern and north-western portions of Milbank sound the soundings are irregular, with depths of 21 fathoms rock and 114 fathoms, mud.

**Coast.**—Between cape Swain and Sound point the land is low, wooded, and broken into creeks and bays.

**PRICE ISLAND**, forming the western shore of Milbank sound, has a conspicuous ridge of hills along its eastern shore, from 300 to 600 feet in height. The cluster of islets off Day point are wooded and conspicuous; and from Day point the eastern shore of Price island trends in a N. by E. direction for 4 miles to Aldrich point, and is much broken into small exposed bays.

**Boat cove**, which affords shelter to boats, is situated half-a-mile northward of Aldrich point. With this exception the coast of Price island, north of Aldrich point, is almost straight and unbroken for 8 miles, in a N.N.W.  $\frac{1}{2}$  W. direction to the entrance of Schooner passage.

**The eastern shores** of Milbank sound are comparatively low and wooded, with pine and cedar trees predominating. In that portion of the sound lie two extensive channels (Mathieson channel and Moss passage), which enter Milbank sound eastward and northward of Lady island, respectively. Lady island is low and wooded throughout. The western shores of Dowager island are also low and wooded, but are flanked by high mountains.

The south-east extreme of an island contiguous to Lady island, terminates in a high bold cliff (Boulder point). Cliff island which lies off the south-west side of Dowager island at the entrance of Moss passage is small, 225 feet high, and its south-east extreme terminates in high, conspicuous white cliffs.



North island is rocky, about 150 feet high, with some stunted trees growing on its summit.

**Low point**, the western extreme of Dowager island, and the south-east entrance point of Finlayson channel, is low and wooded.

**The north-western shore** of Milbank sound is high and bold with mountains 1,500 to 2,000 feet high rising immediately over it.

**Directions.**—Approaching Milbank sound from the south-westward in clear weather, Helmet peak should be kept in line with White rock, bearing N.N.E.  $\frac{1}{2}$  E., which mark will lead nearly in mid-channel up the sound. When within  $2\frac{1}{2}$  miles of White rock, on that line, a vessel bound eastward may steer E. by N.  $\frac{3}{4}$  N. towards Seaforth channel, with Day point astern bearing W. by S.  $\frac{3}{4}$  S., or if bound to the northward a N. by W. course may be steered towards Finlayson channel.

In thick weather, as before mentioned, with average precautions and attention to the deep sea lead, the soundings will indicate the vessel's position.

Approaching from Seaforth channel, and bound into Finlayson channel, Surf point should be kept astern bearing E. by S. for 3 miles, which will lead in mid-channel,  $1\frac{1}{2}$  miles northward of White rock. In this position Cliff island should be seen open westward of Boulder point, bearing N.N.W.  $\frac{1}{2}$  W., and a vessel may steer N.W. by W.  $\frac{1}{2}$  W. for 3 miles, or until Low point is seen open westward of the North island group bearing North, thence N.N.W. for 3 miles, or until Stripe mountain bears N.E. by N., when it may be steered for on that bearing, and the course gradually altered northward into Finlayson channel.

**MATHIESON CHANNEL** is an extensive arm of the sea leading northward from Milbank sound, eastward of Lady and Dowager islands, with depths of 103 and 105 fathoms in mid-channel. At the distance of  $2\frac{1}{2}$  miles within its south entrance this channel is obstructed by islands, islets, and rocks. A stranger should therefore not attempt to proceed further.

**Moss passage** (Too-witl), leads northward of Lady island into Mathieson channel. At its western entrance this passage is over a mile wide; but at 3 miles within this entrance, and one mile from its junction with Mathieson channel, it is barely a cable wide. Beyond that position, therefore, it should not be attempted by a stranger.

**Tides.**—The flood stream approaches from the southward, and divides near the middle of the sound; one portion running towards Finlayson channel, another towards Mathieson channel, and another towards Seaforth channel. The reverse takes place on the ebb.

The rate of tide is variable, but it seldom exceeds one knot an hour in Milbank sound; that rate however is increased within the channels to 2 and 3 knots an hour.

**ST. JOHN HARBOUR (Cheek-Squintz)** is the first anchorage met when approaching from the south-westward, and lies on the south-east shore of Milbank sound, nearly midway between cape Swain and Sound point.

This harbour, though confined, with a narrow entrance, affords good anchorage for small vessels. It is protected at its entrance by a reef of rocks awash, and sunken rocks, which form a natural breakwater, and breaks the ocean swell.

Eastward of this reef, at the entrance of the harbour, there is a clear channel, 2 cables wide, with depths of 10 to 30 fathoms.

At 5 cables within the entrance lie two small islands, the eastern and smaller one being round, wooded, and conspicuous (Wood island). The channel eastward of these islands is barely a cable wide abreast Wood island, and leads into Anchor bay, which is the usual anchorage for small vessels. Westward of these islands the channel is wider and leads into Deep bay, which forms the south-west arm of St. John harbour.

The depths in Deep bay are 9 to 20 fathoms; the depths in Anchor bay are 11 to 14 fathoms.

**Rage reef** extends 7 cables northward from the west point of St. John harbour, and is about 2 cables wide. This dangerous reef consists of ledges which uncover, and rocks awash at high water, the northern extreme uncovers 4 feet at low water.

**Mark islet** is 6 feet above high water, and lies about midway on the eastern side of Rage reef.

**Ledges**, which uncover, extend a cable from the eastern shore of the channel leading into St. John harbour.

**Directions.**—Approaching St. John harbour, cape Swain should be kept well open of the conspicuous quoin-shaped point which lies 2 miles northward of the cape, bearing S.  $\frac{1}{2}$  W. On no account should Rage reef be approached inside that line, until Wood island, within the harbour, is distinctly seen, and North point bears East. When Wood island is recognised it should be brought to bear S.S.E.  $\frac{1}{4}$  E., and steered for. Wood island on that bearing should be seen in line with a black high-water rock on the south shore of Anchor bay, with a sandy bay immediately east of the rock.

**Anchorage.**—Pass half a cable eastward of Wood island, and anchor in 10 to 11 fathoms, sand bottom, in Anchor bay, with the

eastern side of Wood island seen in line with the north extreme of Rage reef, bearing N.W.  $\frac{1}{2}$  W., distant 3 cables.

**Caution.**—At high water, when Rage reef is covered nearly throughout, it is difficult to distinguish the entrance into St. John harbour. At half-tide and at low water the northern end of that reef and also the dangers on the eastern side of the channel are visible, and a vessel can be guided clear of them by the eye. That period of the tide is therefore the best time for entering St. John harbour.

**PORT BLAKENEY\*** on the south side of Mathieson channel, about 3 miles within the entrance, is easy of access, and lying immediately at the head of Milbank sound may be approached from the south-westward with the swell astern.

At its entrance, between Promise, and Ruin points, the port is  $2\frac{1}{2}$  cables wide, thence it takes a southerly direction for about a mile, terminating in the mouth of a small creek leading into Seaforth channel.

**Cod reefs** are a cluster of rocks awash, and sunken rocks, about  $2\frac{1}{2}$  cables in extent in a north and south direction at the mouth of port Blakeney. The southern rock of this cluster is 4 feet above high water, and the northern rock with 24 feet water over it lies N.N.E. 3 cables from Promise point, with a clear channel northward of it  $1\frac{1}{2}$  cables wide.

**Oke reefs**, situated about 2 cables northward of Cod reefs, extend 2 cables from the south side of Oke island. The outer detached rock is 3 feet above high water, and between it and Oke island several patches of rock uncover at low water.

**Clearing marks.**—White rocks off the south end of Lake island, seen in line astern, with the north end of Passage island (between Lake and Lady islands) bearing W.  $\frac{1}{2}$  N. will lead between Oke and Cod reefs. Mark islet, seen in line with Oke island, bearing N.W. by N. will lead eastward of those dangers.

**Sand patch** with 24 feet water upon it is of small extent, and lies nearly in mid-channel about 5 cables within port Blakeney. Helmet peak, seen in line with Promise point, bearing N. by W.  $\frac{1}{2}$  W., will lead westward of Sand patch.

**Anchorage** in 10 to 12 fathoms, sandy bottom, will be found about 5 cables within port Blakeney, with Helmet peak seen just open of Promise point bearing N. by W.  $\frac{1}{2}$  W., and Observation point on the north shore of East bay bearing E. by N.  $\frac{1}{2}$  N.

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\* See Admiralty plan:—Port Blakeney on sheet of plans, No. 1462; scale,  $m=3$  inches.

**Tides.**—It is high water, full and change, in port Blakeney, at Noon; springs rise 13 feet, neaps 8 feet.

**Supplies.**—Wood and water may be obtained in port Blakeney.

Rock cod and other fish may be caught in abundance on Cod reefs, and shell fish (clams and cockles) in the sandy bays. They are readily obtained at low water by digging in the mud and sandy ground, especially in those places over which a fresh water stream runs.

Wild fowl are also plentiful in the season.

**Directions.**—Approaching port Blakeney from the southward Helmet peak should be kept just open of the eastern point of Lady island (Long point) bearing N. by E.  $\frac{1}{2}$  E., and when within 5 cables from the latter a N.E.  $\frac{1}{2}$  N. course should be steered towards Oke island. The clearing mark before mentioned for leading between the Oke and Cod reefs should be brought on astern, namely, White rocks in line with the north end of Passage island bearing W.  $\frac{1}{2}$  N., and when Mark and Oke islands are seen in line bearing N.W. by N. a vessel will be eastward of Cod reefs, and may then haul into the harbour with the south extreme of William island astern, bearing North, and anchor in the depth and position before mentioned.

**MORRIS BAY**, situated on the south side of Moss passage, about one mile within its western entrance, is  $2\frac{1}{2}$  cables wide and extends in a south-easterly direction for 3 cables, terminating in a cul-de-sac which dries at low water. Westerly winds send a swell into the anchorage; but the bay possesses the great advantage of permitting the state of the weather in Milbank sound being ascertained when at anchor, and if fog be prevalent (as is often the case) it can be seen from Morris bay.

**Bird rock**, situated at the western entrance of Moss passage, is 3 feet above high water, with foul ground extending from it 2 cables to the eastward. This rock lies E. by S. distant 3 cables from the south extreme of Cliff island. The south extreme of the North island group seen just open southward of the south extreme of Cliff island, bearing W. by N. leads southward of Bird rock.

**Kitty patch** lies at the eastern entrance of Morris bay, a cable from the eastern shore. This bank is one cable in extent north and south, with depths of 4 and 5 fathoms, sand.

**Directions.**—Approaching Morris bay, the mid-channel course should be kept between Bird rock and Salal point; and if Vancouver rock

be uncovered, it should be kept astern bearing S.W. by W. (westerly). When the south extreme of Cliff island is seen, open northward of Bird rock, bearing W.  $\frac{3}{4}$  N., that mark kept on astern will lead to the mouth of Morris bay.

**Anchorage** will be found in 12 to 14 fathoms, sandy bottom, a cable from the western shore, with Salal point shut in by the western entrance point of Morris bay, bearing W. by S.  $\frac{1}{2}$  S., and Detached island (north side of Moss passage) bearing N.N.W.

**Supplies.**—Good water may be obtained in Morris bay. Clams and cockles can be gathered in abundance. Plover and other birds frequent Bird rock. Berries grow in abundance on Salal point.

**ALEXANDRA PASSAGE** lies northward of Vancouver rock and the North island group. Small steam vessels, possessing local knowledge, make use of Alexandra passage; and especially when coming from the northward if wishing to anchor in Morris bay. But this passage is barely 6 cables wide in its narrowest part; and in the event of an accident to the machinery a vessel using it would be in a dangerous position.

**Dangers.**—Vancouver rock, the ledges northward of North island group, and the other dangers in Alexandra passage have been already described. Cliff island is nearly steep-to, but the small islet close northward of it has foul ground extending from it one cable to the westward.

**Soundings.**—The depths in Alexandra passage are 14 to 42 fathoms, rocky at the former, and mud at the latter depth.

**Directions.**—A vessel compelled by circumstances to make use of Alexandra passage should keep point Jorkins (western side of Finlayson channel), in line with Low point, bearing N. by W.  $\frac{1}{2}$  W., which is the general leading mark through this passage. It is, however, recommended alternately to open and close those points, especially when nearing North island group, so as to keep in mid-channel.

**SCHOONER PASSAGE** leads into Laredo sound, and its eastern entrance is situated in the north-west corner of Milbank sound. This passage is obstructed by islands, islets, rocks, and sunken dangers. No specific directions can be given for it. It is occasionally made use of by the small coasting craft; the large canoes of the Queen Charlotte islanders also pass through it when making the passage to Vancouver island.

**FINLAYSON CHANNEL** is the main channel leading northward from Milbank sound.

From mid-channel between Jorkins and Low points, Finlayson channel extends in a northerly direction for 3 miles; thence in a general direction N.N.W.  $\frac{1}{4}$  W. westerly for 18 miles, and N.  $\frac{1}{2}$  E. 6 miles to the head of Carter bay, with an average width of one to 2 miles. The land on both sides is from 1,000 to 3,000 feet high. Unless where the vegetation has been denuded from the mountain sides by landslips both shores are thickly wooded, the pine and cedar predominating; occasionally their dark green foliage is relieved by the bright light green leaf of the maple.

**Landmarks.**—Stripe mountain lies at the south-east entrance of Finlayson channel and has already been described at page 20. The summit of Cone island (Bell peak), together with two high waterfalls which fall into the sea on the south-east side of Sarah island, are the principal landmarks of importance.

**Soundings.**—The depths in Finlayson channel are from 40 fathoms, rock, to no bottom at 153 fathoms. The former depth was found in mid-channel abreast the north extreme of Cone island.

**Oscar passage** leads eastward out of Finlayson channel, and lies between Dowager and Roderick islands. This channel is about one mile wide, and 6 miles long to its junction with Mathieson channel. There is no bottom at 38 fathoms in mid-channel in Oscar passage.

**Bulley bay** situated on the south shore of Oscar passage,  $3\frac{1}{2}$  miles within its western entrance, though small, affords temporary anchorage in 15 fathoms, a cable from the shore, and is occasionally used by the coasting vessels.

**Sisters** are two small islets, lying 2 cables from the eastern shore of Finlayson channel,  $3\frac{1}{2}$  miles northward of Oscar passage. They lie north-west and south-east 4 cables from each other, and are joined by ledges which uncover at low water. These islets are wooded, about 90 feet high.

**Nowish (Otter Cove)\*** lies 5 cables northward of the Sisters islets, between Indian and Susan islands. The entrance, northward of Indian island, is 2 cables wide; the cove then extends in an E.S.E. direction for 5 cables, contracting near its head, to a cable wide, and having on its north shore, about 4 cables within the cove, a small bay, which affords anchorage for small vessels in 10 to 14 fathoms, sandy bottom, in the middle of the bay.

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\* See Admiralty plan:—Nowish cove, on sheet of plans, No. 1462; scale,  $m=4$  inches.

**Jackson passage** is an unexplored arm, on the eastern shore of the channel; it is 2 cables wide, and extends in an easterly direction from its entrance.

**Mary cove**, situated on the eastern shore,  $5\frac{1}{2}$  miles northward of the Sisters islets, is barely a cable wide at its entrance, and extends in a northerly direction for 5 cables, terminating in a sandy beach. There are depths of 24 and 7 fathoms in mid-channel within this cove; and at 2 cables southward, 130 fathoms, rock.

**Cone island**, on the western shore of Finlayson channel, is  $3\frac{1}{2}$  miles long in a N.W.  $\frac{1}{2}$  N. and S.E.  $\frac{1}{2}$  S. direction, and about 5 cables broad. The summit of this island, situated about one mile from its south extreme, is conical in shape, 1,280 feet high; the eastern and western sides are abrupt and precipitous; but the land slopes gently to the northward terminating in Wedge point.

**Jane island** situated 5 cables northward of Cone island is about one mile long in a N.W. and S.E. direction, and 5 cables broad. It is low and wooded, the tops of the trees being 200 feet high.

**Sarah island** lies 6 cables northward of Jane island. It is 15 miles long in a N.N.W. and S.S.E. direction, and one mile to  $2\frac{1}{2}$  miles broad. This island reaches its greatest elevation of 3,000 feet, at 4 miles from its south extreme. On the south-east side of the island, at 7 miles from the south extreme, an unexplored bay faces south-eastward, and at  $3\frac{1}{2}$  miles from the south extreme of Sarah island, on its eastern shore, there are two high waterfalls.

**Watson bay** lies on the eastern side of the Finlayson channel, 9 miles northward of Sisters islets. This unexplored bay is one mile wide at its entrance, and extends in an easterly direction.

**Wallace bight** lies 2 miles northward of Watson bay. It is one mile wide at its entrance, and takes a northerly direction for one mile. There is no bottom at 106 fathoms, between its entrance points.

**Goat cove**, situated one mile northward of Wallace bight, is 5 cables wide, and extends in an easterly direction for 5 cables, terminating in a sandy beach. There are depths of 23 to 34 fathoms within this cove, the former being close to the head.

**Sheep passage** is nearly one mile wide, and leads eastward from Finlayson channel, just south of Carter bay. At 3 miles within its western entrance, it trends northward until its junction with Mussel inlet.

**Mussel inlet** has not been explored since Vancouver's visit in 1793. It is stated to have the same general characteristics as the other inlets.

**CARTER BAY.\***—This excellent stopping place lies at the head of Finlayson channel, 26 miles within its entrance, and should be recognised by the high cliffs on its western shore.

Carter bay is 4 cables wide at its entrance, abreast the anchorage ground, and about 6 cables deep in a northerly direction. The head of the bay terminates in a large stream, fronted by an extensive flat. This stream takes a north-easterly direction for about a mile, to the foot of a waterfall, at the mouth of a lake.

**Anchorage** will be found in 14 to 15 fathoms, mud bottom,  $1\frac{1}{2}$  cables from the eastern shore, and 2 cables from the sand flat at the head of the bay; with the entrance points of the bay bearing S.E.  $\frac{3}{4}$  S. and S.S.W.  $\frac{1}{2}$  W. respectively.

**Supplies.**—Water can be obtained from the large stream at the head of the bay. This bay is probably one of the best watering places along the coast. Trout abounds in the fresh water stream. Tracks of bear and deer were seen on the shore.

Wild fowl frequent Carter bay. The shell fish, of whatever kind, should not be eaten.

**Tides.**—It is high-water, full and change, in Carter bay at Noon; springs rise 13 feet.

**Observation spot,** on the western shore of the bay, is in latitude  $52^{\circ} 49' 41''$  N., longitude  $128^{\circ} 24' 34''$  W.

**HIE KISH NARROWS** lie northward of Sarah island, and lead from Finlayson channel into Graham reach. This channel is about  $5\frac{1}{2}$  miles long, in a general N.W. and S.E. direction, and from  $2\frac{1}{2}$  cables to one mile wide. The western part of Hie Kish narrows lies about half a point more west and east than the eastern part. The depths in the narrows are 31 and 73 fathoms in mid-channel, bottom sand and shells.

**Hewitt rock** lies at the western entrance of Hie Kish narrows, nearly in mid-channel. This dangerous sunken rock has 10 feet over it, with deep water close to.

The north shore of the channel should be kept on board when navigating the western portion of Hie Kish narrows. The south

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\* It was so named by Vancouver, from a seaman of the *Discovery*, named John Carter, having died here in June 1793, from eating poisonous mussels. The mussels, however, were said to have been gathered on the sand and not on the rocks. (Vancouver's voyages. Vol. II., pp. 285-6.) See Admiralty plan:—Carter bay, on sheet of plans, No. 1901; scale,  $m=4$  inches.



point of Carter bay, seen just open of the north extreme of Sarah island, bearing S.E.  $\frac{3}{4}$  E., leads northward of Hewitt rock.

**KLEMTOO PASSAGE\*** lies between Cone and Swindle islands. The passage is about  $3\frac{1}{2}$  miles long in a north-west and south-east direction, and in some parts barely a cable wide. Its southern entrance is a cable wide, and extends in a N.W.  $\frac{1}{4}$  W. direction for about one mile; thence in a general direction N.W.  $\frac{3}{4}$  N. for  $2\frac{1}{2}$  miles, to abreast the north extreme of Jane island. The depths in mid-channel are 10 and 30 fathoms, sand and shells, with rock at intervals.

Though narrow, this passage is safe (provided the mid-channel course be kept), and affords anchorage almost throughout. The tides are comparatively weak within it.

**Anchorage**, suitable to vessels of moderate length, will be found nearly in mid-channel, a cable from the shore of Cone island, at  $1\frac{1}{4}$  miles within the eastern entrance, in 12 fathoms, sand and shells.†

**Tides.**—It is high-water, full and change, in Klemtoo passage at Noon; springs rise 13 feet; neaps 8 feet; and the neaps range 3 feet.

**Observation spot**, on a small islet close to the western shore of Star island, is in lat.  $52^{\circ} 34' 22''$  N., long.  $128^{\circ} 32' 09''$  W.

**South passage** lies between Cone and Jane islands, and is 5 cables wide, with depths of 18 and 37 fathoms, rock.

**Kelp Patch** lies a cable to the southward of Jane island, and is about a cable in extent in a south-east and north-west direction. The depths over Kelp patch are 5 to 12 feet.

Berry point (north side of Swindle island) seen just open of Legge point (south side of Cone island) bearing S.S.E.  $\frac{1}{2}$  E., will lead southward of Kelp patch.

**Wedge rock** uncovers at low water, and lies 50 yards from the north extreme of Cone island.

**Ripple bank**, with 11 fathoms, rocky bottom, lies nearly in mid-channel of South passage.

**Directions.**—When proceeding through South passage, the south shore should be kept on board, passing 2 cables northward of Cone island.

**NORTH PASSAGE** lies between Jane and Sarah islands, and is 5 cables wide, with depths from 22 fathoms to no bottom at 38 fathoms.

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\* See Admiralty plan:—Klemtoo passage and anchorage, on sheet of plans, No. 1462; scale,  $m=4$  inches.

† A vessel using this anchorage should be prepared for a foul anchor when weighing.

**Danger patch** with one to 3 fathoms water over it, lies a cable north-westward of Jane island.

**Directions.**—North passage is to be preferred to South passage when communicating between Finlayson and Tolmie channels. Keep nearer the north shore, and pass 2 cables south of Sarah island.

**TOLMIE CHANNEL** situated between Princess Royal and Sarah islands, is about 15 miles long in a general N.N.W. and S.S.E., direction, and from a half to one mile wide, with depths from 35 fathoms to no bottom at 104 fathoms. From a position in mid-channel abreast the north end of Cone island, Tolmie channel extends N.W.  $\frac{3}{4}$  N. for 5 miles, to abreast a small islet on the north shore, thence N.N.W. for 10 miles, until its junction with Fraser reach.

On the south shore,  $2\frac{1}{2}$  miles northward of Sarah island, an extensive arm takes a southerly direction, and is reported to communicate with Laredo sound. Abreast the north-eastern point of this inlet, a small islet lies close to the shore of Sarah island.

**Caution.**—The northern reach of Tolmie channel looks directly into this inlet, care is therefore necessary when approaching from the northward not to mistake this unexplored arm for the reach leading to Klemtoo passage.

At 2 miles northward of the above-mentioned inlet, on the south shore of Tolmie channel, lies another unexplored passage, facing the south-east.

**Tolmie rock**, with 4 feet water lies 100 yards from the shore of Sarah island, at 5 cables within the northern entrance of the Tolmie channel.

**Directions.**—Tolmie channel, though not so wide as Finlayson channel, is preferable in some respects, especially if compelled to be under way at night. The mid-channel course should be steered throughout, except when navigating the northern part of the channel, when the south shore should be neared to avoid Tolmie rock.

**Tides.**—The flood stream approaches from the southward, and is stronger in Finlayson than in Tolmie channel. The ebb, however, is stronger in Tolmie channel, and runs for  $1\frac{1}{2}$  hours after the ebb has ceased in Finlayson channel. In the narrow parts of these channels, both flood and ebb streams attain a velocity of 3 knots an hour at springs.

In Klemtoo passage, the flood stream is but little felt, the great body of water passing into Finlayson channel. The ebb seldom exceeds the rate of one mile an hour.

**GRAHAM REACH** situated northward of the junction of Tolmie channel with Hie Kish narrows, is about 17 miles long, in a

general N.W. by N. and S.E. by S. direction, and from a half to one mile broad, with depths of 38 fathoms, rock, and 150 fathoms, sand and shells. From the north-west extreme of Sarah island this reach takes a N.W. by N. (northerly) direction for 7 miles, to abreast Swanson bay, thence it takes a N.W.  $\frac{1}{4}$  N. direction for  $10\frac{1}{2}$  miles to abreast Red cliff point.

In general features this reach resembles Finlayson channel.

**Green inlet** lies on the north shore, 2 miles northward of Sarah island. This unexplored arm takes an easterly direction at its entrance.

**Flat point** lies on the west shore, 3 miles westward of Green inlet. This point is wooded, flat, and comparatively low. Abreast Flat point on the south shore of the channel lies a remarkable large boulder rock.

**Dangers.**—There are no known dangers at one cable from the shore in this reach.

**Swanson bay** lies on the north shore, 7 miles from Sarah island. There is a conspicuous waterfall on the south shore of the channel abreast Swanson bay.

Anchorage may be obtained in 19 fathoms, sandy bottom, in the northern part of this bay, with the conspicuous waterfall on the south shore shut in with the north entrance point, and Flat point shut in with the south entrance point of the bay.

**Khutze** is an unexplored arm, on the north shore, 6 miles westward of Swanson bay. It is 5 cables wide, and lies in a N.E. by E. direction from its entrance.

**Anchorage** is reported by Indians at the head of this inlet.

**Aaltanhash** is another unexamined inlet on the north shore, 2 miles westward of Khutze. In size and direction it is similar to Khutze, and is reported by Indians to afford anchorage.

**Tide** .—The tides meet abreast Aaltanhash inlet.

**Red cliff point**, the turning point into Fraser reach, lies on the south shore,  $17\frac{1}{2}$  miles from Sarah island. This point terminates in a conspicuous cliff of red brown colour.

**FRASER REACH** is the name of the channel north-westward of Graham reach. It is  $12\frac{1}{2}$  miles long in a general W. by N. and E. by S. direction, and a half to  $1\frac{1}{2}$  miles wide, with depths of 62 fathoms, rock, to no bottom at 145 fathoms.

In features it resembles Finlayson channel.

**Wark island** is  $1\frac{1}{2}$  miles long in an east and west direction, and half a mile broad. The east extreme of this island lies W.N.W., distant one mile from Red cliff point. The channel on both sides of the island is deep, but that to the south is slightly the wider. There is a bay on the south shore of the channel, abreast Wark island, at the head of which is a fine trout stream, communicating with a large lake. Fraser reach from abreast Wark island, runs in a W. by N. direction for 5 miles, thence W.N.W. for 6 miles to abreast Kingcombe point.

**Klekane** an unexamined arm on the north shore, abreast Wark island, is 5 cables wide, and runs in a N.W. direction from its entrance. Approaching from the south-eastward, this arm appears as the continuation of Graham reach.

**Anchorage** may from Indian report be obtained at the head of Klekane inlet.

**Landslip point** lies on the north shore, 4 miles westward of Wark island. Over this point is a remarkable landslip.

**Kingcombe point**, the turning point into McKay reach, lies on the south shore 12 miles from Red cliff point. The point is long, sharp, and conspicuous.

**McKAY REACH** is the name of the channel westward of Fraser reach, leading into Wright sound. This reach is about 8 miles long in a general W.S.W. and E.N.E. direction, and from one mile to 2 miles wide, with no bottom in mid-channel at 139 and 225 fathoms, the latter depth at 2 cables southward of Cumming point.

From mid-channel abreast Kingcombe point, the reach takes a W.S.W. direction for 4 miles to abreast Trivett point; thence a S.W. by W. direction for 4 miles to abreast Cumming point. Westward of Kingcombe point, a deep bay lies on the south shore, between Kingcombe and Trivet points.

The land on the north shore of the channel is high and bold, with mountains 3,000 feet high. The land on the south shore is not so high; and near the summits of the mountains are some extensive bare patches of slate colour.

**WRIGHT SOUND.**—This sheet of water is 9 miles long in an east and west direction, and  $2\frac{1}{4}$  miles wide at its narrowest part, with no bottom at 119 and 220 fathoms.

In its eastern portion lies McKay reach, and in its western, Grenville channel. Whale channel and Lewis passage lead southward, and Douglas channel and Verney passage lead northward from Wright sound.

**Landmarks.**—Gil island on the south side of the sound culminates in a well defined snow clad peak 3,000 feet high. (*See* page 84.)

The mountains north-eastward of Holmes bay have bare patches down their sides.

Promise island, on the north side of the sound, with its two dome-shaped mountains, and the south-east extreme of that island (cape Farewell).

**HOLMES BAY\*** (Quel-ak-sea-hx), situated on the eastern shore of the sound at the entrance of Whale channel, is 8 cables wide at its entrance, and recedes in an easterly direction for about 4 cables, terminating in a sand flat, which extends a cable from the head of the bay.

The north entrance point is high and bold, and a small islet lies off the south entrance point of the bay.

**Anchorage** will be found in 14 fathoms, sand, with the south extreme of Promise island in line with the north point of the bay, bearing W. by N.  $\frac{1}{2}$  N., and Gil mountain in line with the south entrance point, S.W. by W.

**Tides.**—It is high water, full and change, in Holmes bay at 1h.; springs rise 13 feet, neaps 10 feet.

**Observation spot**, on the south-west point of the bay, is in lat.  $53^{\circ} 16' 25''$  N., long.  $129^{\circ} 5' 19''$  W.

**Fisherman cove** was the name given by Vancouver to an anchorage one mile eastward of Turtle point, close to the shore of Gil island. The water is deep, and the anchorage reported indifferent.

**PROMISE ISLAND** lies at south end of Douglas channel. The island is  $3\frac{1}{4}$  miles long in a N.N.W. and S.S.E. direction, with an extreme breadth of 2 miles. Promise island is covered with pine and cedar, and culminates in two peaks of dome-shape, 1,680 and 1,710 feet high respectively. The south-east extreme of the island (cape Farewell) terminates in a high, bold cliff. A conspicuous white cliff lies on the south shore, midway between cape Farewell and Thom point.

The east shore of the island is high, with an occasional bay with a sandy beach at its head. The north extreme (Dawson point) is low and wooded.

**Farewell ledge** uncovers at low water, and extends 2 cables south-east of cape Farewell. This ledge is nearly steep-to, there being no bottom at 40 fathoms at 30 yards from it. Ledges extend one cable from the eastern shore of Promise island.

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\* *See* Admiralty plan:—Holmes bay, on sheet, No. 1901; scale,  $m = 5.5$  inches.

**Dawson ledge** extends 2 cables northward of Dawson point, and uncovers at half ebb.

**COGHLAN ANCHORAGE**,\* situated about one mile westward of cape Farewell, is 3 cables wide at its entrance between Camp and Thom points, and extends in a north-west direction for 2 miles, widening within the entrance to 4 cables.

**Thom ledge** extends 100 yards south-west of Thom point, (the eastern entrance point of Coghlan anchorage).

**Promise ledge** extends 50 yards from Promise point.

**Observatory ledge** extends 100 yards eastward of Observation point.

**Harbour rock** is a dangerous rock of small extent, which uncovers 6 feet at low water, and lies nearly in mid-channel near the head of the harbour. This rock is nearly steep-to, there being depths of 10 and 18 fathoms at 100 feet from the rock.

Gil mountain seen in line with Thom point, bearing S.E. (easterly) will lead north-east, and Camp point (west entrance point of Coghlan anchorage) seen just open of Observation point, bearing S.E.  $\frac{1}{4}$  S., will lead westward of Harbour rock.

**Otter shoal** extends 100 yards from the western shore at the head of the anchorage, with depths of 3 fathoms and less upon it.

**Soundings**.—Southward of Observation point there are depths of 24 to 40 fathoms; northward of that point 19 to 7 fathoms, sand.

**Anchorage** in 6 to 7 fathoms, sand, will be found near the head of Coghlan anchorage, with Gil mountain just shut in with Thom point, bearing S.E., and Stephens point just open of Letitia point (Stewart narrows) bearing N.E. by N. Or, for a long vessel, or not wishing to go beyond Harbour rock, a berth, in 24 fathoms, in mid-channel, at 5 cables south-east of Observation point, may be found.

**Directions**.—When entering, keep mid-channel, to avoid the ledge which uncovers off Thom point, and proceed to the anchorage with the leading mark above given for clearing Harbour rock on astern; and anchor as before directed.

**Stewart narrows** lead northward of Promise island into Douglas channel. The tides in this passage are strong, and the channel confined; it is therefore not recommended.

**Tides**.—It is high water, full and change, in Coghlan anchorage at Oh. 30m.; springs rise 18 feet, neaps 14 feet.

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\* See Admiralty plan:—Coghlan anchorage, on sheet of plans, No. 2189; scale,  $m = 3 \cdot 25$  inches.

**Tidal streams.**—The flood stream which enters Campania sound from the southward, divides off Passage island, and the main body of water passes up Squally channel. The lesser body, passing into Whale channel, skirts the north shore of Gil island, and unites at one mile northward of Turtle point, with the main body of water which has entered Wright sound by Lewis passage. The flood stream from that position, sets directly across Wright sound, and impinging against Camp point, causes very strong eddies off that point, and is then deflected towards Grenville channel.

A portion of the flood stream by Whale channel turns into McKay reach, and meets abreast of Aultanhush inlet the flood stream from the Finlayson channel. Another portion proceeds into Douglas channel and Verney passage. On the ebb, the reverse takes place, the main body of water from Wright sound obtaining an exit by Whale channel.

The ebb streams from Wright sound, Douglas channel, and McKay reach, unite nearly midway between Maple point and Holmes bay, setting directly towards the latter, producing strong eddies at the mouth of Holmes bay. Thence the stream sets fairly through Whale channel, and passing north and south of Passage island, unites with the stream of Squally channel, and united they pass out into Campania sound.

Both flood and ebb streams attain the velocity of 3 knots an hour, at springs, in the contracted portions of the channels.

**Dean Canal.**—See page 47.

**GRENVILLE CHANNEL** leads north-westward out of Wright sound; and is the usual channel taken by steam vessels when proceeding to the northern waters of British Columbia.

Grenville channel at its south-east end abreast York point is 8 cables wide, thence it extends in a W. by N.  $\frac{1}{4}$  N. direction for 4 miles to abreast Davenport point, with an average width of one mile. From this point the channel takes a W.N.W. direction for 11 miles, and narrows to 3 cables as Low inlet is approached, seldom exceeding 4 cables in width until north-westward of Evening point (Klewnuggit). From a position in mid-channel one mile westward of Lowe inlet, the Grenville channel takes a N.W. by W.  $\frac{3}{4}$  W. direction, for 7 miles, to abreast Evening point, thence it widens out to one and 3 miles; and extends W. by N.  $\frac{1}{2}$  N. for 23 miles, to abreast the Ogden channel. The depths in Grenville channel are 48 and 133 fathoms, rock.

The land on both sides is high, reaching the elevation of 3,500 feet on the north; and from 1,000 to 2,000 feet on the south shore, and, as a rule, densely wooded with pine and cedar.

The mountains rise almost perpendicularly above water; and cause the southern portion of this narrow channel to appear even narrower than

it is (3 cables). But the general effect, of so many mountains rising one behind the other, renders the Grenville channel one of the most beautiful landscapes on this coast; and is equalled only by Klemtoo passage.

Grenville channel is comparatively free from danger, at half a cable from either shore, with the following exception:—

**Morning reefs** extend N.W. by W. nearly one mile from Evening point, and 5 cables from the north shore of Nabunah bay.

The south shore of Grenville channel must be kept on board when passing Morning reefs.

Bare islet (north side of Klewnggit inlet) kept open of Camp point (south side of that inlet) bearing N.E.  $\frac{3}{4}$  E. will lead westward of Morning reefs.

**LOWE INLET**,\* situated on the north shore of Grenville channel, about 14 miles from Wright sound, is a little over  $2\frac{1}{2}$  cables wide at its entrance between James and Hepburn points. From mid-channel, between the entrance points, the inlet extends in a N. by E. direction for 5 cables; thence N.N.E. for 6 cables, to the mouth of Nettle basin, and widens to 4 cables.

Nettle basin is nearly circular in shape, with a diameter of 5 cables; but between its entrance points the basin is barely a cable wide.

Into the north-east corner of Nettle basin, a large stream flows, with a waterfall close to its mouth, and several others within (Verney falls). This stream is reported to be connected by a chain of lakes, with Kit-Kiatah inlet (Douglas channel).

**Landmarks.**—On the south shore, at 2 miles eastward of Lowe inlet, there is a remarkable bare hill, 400 feet high.

Tom islet, small and wooded islet, lies close to the north shore, at 2 cables westward of Lowe inlet.

On the south side of the inlet a remarkable mountain, with a conical summit (Anchor cone), rises to the height of 2,010 feet. From its summit, the land slopes northward and south-westward. The latter spur terminates in the eastern entrance point of Lowe inlet; and when seen from the eastward, makes as a long, low, wooded projection. Over the north-west shore of the inlet mountains, with bare summits, rise to the height of 2,000 feet.

**High water rocks**, situated one cable from the western shore, at 4 cables within Low inlet, cover at high water, and lie close to each other in a north and south direction. There is a depth of 23 fathoms, at 100 feet eastward of the rocks.

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\* See Admiralty plan:—Lowe inlet, on sheet of plans, No. 2189; scale,  $m=3.75$  inches.



**Don dat**, with depths of 3 fathoms and less upon it, extends one cable from the head of the bay south of Don point, on the eastern shore.

**Soundings.**—At 2 cables within the mouth of Lowe inlet depths of 10 fathoms and less extend across. Northward of that position the water deepens to 19 and 20 fathoms, mud. Within Nettle basin, the general depths are 15 to 17 fathoms, mud.

**Anchorage** for vessels of moderate length will be found, in mid-channel, at 2 cables within the inlet, in 8 and 10 fathoms, sand and shells. In this position, Anchor cone mountain should bear E. by N.; and the eastern entrance point of the harbour (Hepburn point) S.E. by S. For a long vessel, more convenient anchorage will be found higher up the harbour, in mid-channel, in 20 fathoms, mud, with Anchor cone mountain bearing S.E. by E.

**Supplies.**—Good water can be procured in Lowe inlet, from the stream in Nettle basin.

Trout may be caught in that stream.

Clams are found on the flat at the eastern shore of Nettle basin.

Nettles of a wholesome nature grow on the shores of the basin; and are useful as an antiscorbutic when cooked.

Whiting, in abundance, are caught on Whiting bank, just within the inlet.

**Tides.**—It is high water, full and change, in Lowe inlet at Oh. 30m.; springs rise 17 feet; neaps 15 feet.

**Observation spot** lies on the western shore, one cable within the inlet; and is situated in latitude  $53^{\circ} 32' 30''$  N., longitude  $129^{\circ} 35' 48''$  W.

**KLEWNUGGIT INLET**\* lies  $9\frac{1}{2}$  miles westward of Lowe inlet, on the north shore, and one mile westward of Evening point. The entrance to this inlet lies between Camp point (south shore), and Leading island, and is 4 cables wide. Thence the inlet takes an easterly direction for 4 cables, and there divides; the longer arm (Exposed arm) extends in a south-easterly direction for 3 miles, and terminates in the usual manner, swamp fronted by sand flat. The shorter arm takes a north-west direction for  $1\frac{1}{4}$  miles, passing northward of Leading island, and is  $2\frac{1}{2}$  cables wide.

Morning reefs have already been described (*see* page 39). With that exception, Klewnuggit has no dangers, beyond a cable from the shore.

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\* See Admiralty plan:—Klewnuggit inlet, on sheet of plans, No. 2189; scale,  $m = 3.75$  inches.

**Soundings.**—The water in Exposed arm is deep, there being no bottom at 38 fathoms. In the north-west arm there are depths of 15 and 24 fathoms, mud.

**Anchorage** may be obtained in the north-west arm (Ship anchorage) in 15 to 20 fathoms, mud, in mid-channel, one cable from either shore.

**Directions.**—Entering Klewnuggit inlet, having brought on the clearing mark for passing westward of Morning reefs, keep mid-channel between Camp point and Leading island. Pass 2 cables south-east of the latter, and anchor on its north side in Ship anchorage. In this position the south-east extreme of Leading island should be seen in line with a conspicuous cliff of purple colour, on the south shore of Exposed arm, bearing South.

**Tides.**—It is high water, full and change, in Klewnuggit anchorage at Oh. 30m.; springs rise 17 feet.

**Observation spot** on a high-water rock, close to Morning point; is situated in latitude  $53^{\circ} 39' 24''$  N., longitude  $129^{\circ} 44' 51''$  W.

**STUART ANCHORAGE,\*** situated on the south shore of Grenville channel, 27 miles westward of Lowe inlet, lies 5 cables westward of a long, low, wooded projection, which serves to distinguish it.

**Stag rock** uncovers 13 feet at low water, and lies 4 cables W. by N.  $\frac{1}{2}$  N. from the above mentioned point. This rock has foul ground extending from it 4 cables in a W.N.W. direction, and a small patch which uncovers at low water lies one cable south of the rock.

The whole of this foul ground is indicated by kelp during summer and autumn.

**Anchorage** will be found in 10 to 15 fathoms, rock, W.  $\frac{3}{4}$  S. 2 cables from Stag rock; with the south extreme of Gibson island seen touching the north side of Pitt island (Calvert point) bearing W.N.W. northerly.

**Directions.**—In proceeding for this anchorage, especially at high water, care is necessary. Pass 2 cables westward of the foul ground extending from the Stag rock, and anchor when at one cable to the southward.

**Tides.**—It is high water, full and change, in Stuart anchorage at Oh. 30m.; springs rise 17 feet.

The tidal streams meet abreast Evening point; eastward of that point the flood approaches from the eastward, and westward of the point from the westward.

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\* See Admiralty plan:—Stuart anchorage, on sheet of plans, No. 1901; scale,  $m = 6$  inches.

At springs the flood stream in the narrow portions of Grenville channel attains the velocity of 2 knots, and the ebb 4 knots an hour. The latter stream continues to run for an hour and a half after low water by the shore.

Abreast Low inlet, strong eddies will be felt on the ebb.

**Kxn-geal**, an unexplored inlet on the north shore, 5 miles westward of Evening point, is 5 cables wide at its entrance, and runs in a north-west direction.

A rock which uncovers lies 2 cables south-east of the north-west entrance point of Kxn-geal inlet.

**False Stuart anchorage** lies on the south shore 3 miles eastward of Stuart anchorage. On its north-west side there is a high, bold, projection. This point should serve to distinguish False Stuart anchorage from Stuart anchorage, as the latter has a long, low, projection on its south-east side. The water is deep, close to the shore.

**Kum-ea-lon** is an unexplored inlet on the north shore, abreast of False Stuart anchorage. The entrance is 2 cables wide, and takes a northerly direction. Some small islets lie near the north shore of Grenville channel, westward of Kum-ea-lon inlet.

**Gibson islands** are a group of islands, situated in the western portion of Grenville channel, at its confluence with Ogden channel.

The western and largest island is 160 feet high, about one mile in extent, and wooded. Its shores are broken into several bays. On the east side of Gibson island lies Bloxham island, of small extent. Lamb islet lies one cable from the north-east shore of Gibson island.

**Watson rock** uncovers 11 feet at low water, and lies 2 cables off the south shore of Gibson island.

There is a depth of 47 fathoms, rock, at one cable south of Watson rock

**Bloxham shoal** extends 6 cables north-eastward from the south-east extreme of Bloxham island, and passes northward of Gibson islands at that distance, with depths of one to 3 fathoms water over it.

**GUNBOAT HARBOUR** lies between Gibson and Bloxham islands. This small harbour, which faces the south-east, affords temporary anchorage to small vessels, in 4 to 10 fathoms, one cable within the entrance in mid-channel.

**Bedford island** is of small extent, and lies N.N.W. 5 cables from Gibson island.

**Bedford spit** extends 3 cables south-west of Bedford island. The channel between Bedford and Gibson islands has depths of 4 fathoms and less in it. This passage is not recommended.

**Marrack island** lies 5 cables N.N.W. of Bedford island, and is one mile in extent.

**Marrack rock**, which uncovers, lies nearly in mid-channel between Bedford and Marrack islands.

**KENNEDY ISLAND\*** is  $5\frac{1}{2}$  miles long in a north-west and south-east direction, with an average breadth of 3 miles.

The island is wooded, rising gradually, and culminating near the middle in two conspicuous peaks, 2,765 and 2,470 feet high respectively.

The western and southern shores of Kennedy island are bold, and little broken; the northern shores have not been examined in detail.

**Cardena bay**, on the south-east side of Kennedy island, is fronted by a mud bank, which extends over 5 cables from the shore, with depths of 5 to 10 fathoms upon it.

**Anchorage** may be found on this bank, in 7 to 8 fathoms, 3 cables from the shore of Kennedy island.

**Lewis island**, situated one mile southward of Kennedy island, is low, wooded, narrow, and  $2\frac{1}{2}$  miles long in a north-west and south-east direction.

**ARTHUR PASSAGE** between Kennedy and Lewis islands is about 5 miles long, in a general north-west and south-east direction, and about one mile wide.

**Herbert reefs** lie on the western side of Arthur passage, about 5 cables from the north-east extreme of Lewis island.

This dangerous cluster consists of two rocks which uncover at low water, with depths of 7 and 9 fathoms between them, lying north-west and south-east, distant 5 cables from each other.

There are depths of 37 fathoms and over at a cable northward, and of 20 fathoms at a cable southward of Herbert reefs.

The eastern and smaller Genn island seen in line with the south extreme of White Cliff island, bearing N.W.  $\frac{1}{4}$  W., will lead northward of Herbert reefs.

**Soundings.**—The depths in Arthur passage are from 18 to 63 fathoms, mud.

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\* See Admiralty plan:—Brown and Edye passages, No. 2453; scale,  $m=1$  inches.

**LAWSON HARBOUR** on the north-west side of Lewis island, is about 5 cables long in a north-west and south-east direction, and 3 cables wide.

**Anchorage** for small vessels may be found in 4 fathoms water, in mid-channel, about one cable within Lawson harbour

**Elliott island** is low and wooded ; about  $1\frac{1}{2}$  miles long in a W.N.W. and E.S.E. direction, with a greatest breadth of three quarters of a mile.

**Elizabeth island** is nearly 3 miles long in a W.N.W and E.S.E. direction, with an average breadth of three quarters of a mile. With the exception of a hill, 334 feet high, near its eastern end, this island is low and wooded.

**Bloxam passage**, situated between Lewis and Elliott islands, is about 2 cables wide, with a depth of 21 fathoms in mid-channel.

**CHISHMORE PASSAGE**, between Porcher island and Lewis, Elliott, and Elizabeth islands, is about 4 miles long in a W.N.W. and E.S.E. direction, and from 2 to 5 cables wide, with depths of 4 to 21 fathoms, mud.

**Kelp passage**, between Lewis and Porcher islands is available only for boats.

**Elizabeth rock**, which uncovers at low water, lies one cable off the south shore of Elizabeth island, at one mile within the western entrance of Chishmore passage.

**Anchorage** may be obtained, in mid-channel, in 7 to 10 fathoms, 2 cables off the south shore of Elliott island ; with Genn islands seen midway between Elliott and Elizabeth islands, bearing N.W. by N.

**CHALMERS ANCHORAGE** lies on the north-west side of Elliott island.

Anchorage may be found in 13 to 14 fathoms, 2 cables from the north-west extreme of Elliott island ; with that extreme seen in line with the south extreme of White Cliff island, bearing N.E.  $\frac{1}{2}$  E.

**White Cliff island**, situated nearly midway between Kennedy and Elliott islands, at 6 cables northward of the latter, is about half a mile long in a north and south direction ; its south extreme terminating in high, bold, white cliffs.

**White Cliff ledge** extends 2 cables southward of White Cliff island. There is a depth of 30 fathoms, mud and shells, at one cable southward of this ledge.

**Cecil patch** seldom marked by kelp, has 4 fathoms upon it, and lies West one mile from the south extreme of White Cliff island. There are depths of 7 and 18 fathoms at 100 yards from the patch.

The summit of Kennedy island (Elizabeth peak), seen in line with the south extreme of White Cliff island, bearing E. by S., will lead northward of Cecil patch.

**Bampfield islands** are a group of small islands, lying 2 cables from the north shore of Elizabeth island.

**Genn islands** consist of two small wooded islands, about 120 feet high, lying close together in an east and west direction. The eastern and smaller island lies N.W.  $\frac{1}{2}$  W., distant  $2\frac{1}{2}$  miles from the south extreme of White Cliff island.

**Bribery island**, small and wooded, lies W. by S., 8 cables from the western Genn island.

**Lawyer group** consist of two principal islands, and several smaller ones, about one mile in extent, in a N.W. by W., and S.E. by E. direction.

The eastern and smallest island of the group lies W. by S., distant 5 cables from Bribery island.

**Cruice rock**, of small extent, covers at three-quarters flood, and lies W.  $\frac{1}{2}$  N., distant 3 cables from the western Lawyer island.

**MALACCA PASSAGE**, situated between Porcher island and the Genn and Lawyer groups, is about 6 miles long, in a W. by N. and E. by S. direction, and about  $1\frac{1}{2}$  miles wide, with depths of 21 to 81 fathoms, mud, the latter depth being found in the western portion of the channel.

**Directions.**—The summit of Kenedy island (bare patches on north-west side), seen in line with the south extreme of White Cliff island, bearing E. by S., will lead through Malacca passage.

**SKEENA RIVER**, the largest river on the coast of British Columbia, northward of Fraser river, takes its rise in lake Babine, near the village of Naas-Glee, about 200 miles beyond port Essington. At 120 miles from port Essington the river divides into three branches, known as the Forks of the Skeena, the principal branch taking a northerly direction, the others a north-west and south-east direction respectively. For about 20 miles above port Essington the Skeena river is available for vessels drawing 4 feet water; beyond that distance it is only navigable for canoes. The head of navigation, for vessels drawing over 6 feet, may be said to terminate 6 miles beyond port Essington, and 21 miles from the mouth of Skeena river.

At 6 miles below port Essington, the river divides into three channels, called North, Middle, and Telegraph passages.

These passages have not been examined in detail, and should be entered only under the guidance of a pilot.

The water, as far as port Essington, is stated to be of a light-blue colour, similar to that of Fraser river. The shores of the Skeena are said to be low, and covered with small hard wood and cotton trees; also good sized white oaks, similar to those found on the banks of the Fraser river. The Skeena is stated to freeze over during the winter months at 6 miles below port Essington.

**Minerals.**—Kitsagatla, on the Skeena river, is reported to be an extensive coal country, the seams being cut through by the river, and from 3 to 35 feet thick. Gold is found in small quantities; plumbago is also found.

**Supplies.**—Potatoes of large size and good quality are plentiful; also berries, which are dried by the Indians for their winter food.

**TELEGRAPH PASSAGE**, the southern and principal channel of the Skeena river, is about 8 miles long, N.W. by N. and S.E. by S., with an average width of  $1\frac{1}{2}$  miles.

The western side of the channel is rendered dangerous by sand flats, some of which dry, extending from the eastern side of Kennedy island, but the eastern side has depths of  $4\frac{1}{2}$  to 17 fathoms.

**Caution.**—Unless under the guidance of a pilot, as the channels of the Skeena are subject to periodical changes, it is recommended, before attempting them, to buoy the channel by boats or other means.

**Directions.\***—The following general directions might assist to trace the Channel:—Keep midway between Kennedy and Marrack islands until the south extreme of Kennedy island (Seabreeze point) is seen just open of the south east extreme of that island (Daring point), bearing S.W.  $\frac{1}{2}$  W., and when distant  $1\frac{3}{4}$  miles from the latter point, steer N.N.W.  $\frac{3}{4}$  W.  $5\frac{1}{2}$  miles, keeping on the eastern side of the channel, thence W. by N. for De Horsey island, when the eastern shore of that island should be kept onboard for about  $2\frac{1}{2}$  miles. Thence steer N.E.  $\frac{1}{4}$  E. for 5 miles, with the north extreme of De Horsey island astern, bearing S.W.  $\frac{1}{4}$  W., which should bring a vessel to the anchorage off port Essington.

**PORT ESSINGTON** lies on the south shore, about 5 miles from De Horsey island.

**Anchorage** will be found in mid-channel, abreast port Essington, in 4 to 6 fathoms, mud.

**Raspberry islands**† situated eastward of port Essington, consist of three wooded islets, lying close to the eastern shore.

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\* From a running survey made in H.M.S. *Daring*, in 1878.

† So named by Vancouver on account of the quantity of fine raspberries gathered there.

**De Horsey island** lies about one mile northward of Kennedy island.

**Middle passage**, situated between Kennedy and De Horsey islands, is obstructed at its western entrance by sand flats, some of which uncover. It should not be attempted by a stranger.

**North passage** lies between Tsimpsean peninsula and Smith and De Horsey islands. Mount McGrath on Smith island is conspicuous, 2,200 feet high. At the western entrance of this passage several dangers lie nearly in mid-channel. The navigable channel lies on the south shore, and is barely a cable wide in some parts.

**Anchorage** will be found at one mile within the passage, off Woodcock landing on the north shore, nearly in mid-channel, in 8 to 10 fathoms.

**Soundings.**—The depths in the navigable channels of the Skeena, from the entrances to abreast port Essington, are from 4 to 20 fathoms.

**Tides.**—The night tides rise higher than those of the day; the latter rising 24 feet at springs.

The flood stream at the entrance attains the velocity of 4, and the ebb 5 knots an hour at springs.

#### DEAN CANAL.

The Admiralty survey did not extend to the waters of Dean canal and Gardner channel.

The navigation is, however, considered to be free from obstruction. Her Majesty's ships have at different times visited these localities, and the charts, as corrected from observations resulting therefrom, as also from information furnished by the Government of Canada, may be taken, under ordinary conditions of weather, to be a sufficient guide, in the hands of a careful navigator.

**Anchorage.**—In Douglas channel, at Kit-kia-tah, 6 miles north of Promise island, small vessels may anchor in 5 fathoms, half a mile within the inlet.

Bishop cove, at the north part of Ursula channel, has anchorage in 15 to 20 fathoms in its N.W. part.

In Kit-i-mat arm, in Clio bay, near the head, anchorage will be found in 17 fathoms. This place is used by H.M. ships when communicating with the Kit-i-mat Indians.

Gardner channel:—Richardson point is said to afford anchorage on each side of it, in from 18 to 5 fathoms. Also at Kemano bay, anchorage of an indifferent character may be obtained, but the water is deep and shoals suddenly.

It is stated to be high water at Kemano bay (June) at 11. 0m. p.m. Springs rise about 9 feet. In the winter months, ice is said to form at 25 miles from the head of Gardner channel.

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## CHAPTER III.

CHATHAM SOUND, EYDE AND BROWN PASSAGES, AND DIXON  
ENTRANCE.

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 VARIATION 27° Easterly in 1883.
 

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## CHATHAM SOUND.\*

**GENERAL REMARKS.**—Chatham sound is an extensive sheet of water about 38 miles long in a general N.W. by N. and S.W. by S. direction, and from 7 to 14 miles wide.

It lies between the Tsimpsean peninsula and Stephens and Dundas islands, the north-western portion of the sound washing the southern shores of Alaska.

In the middle of the southern portion of the sound lie two groups of islands (Rachel and Lucy islands), together with other detached islets and rocks, especially on the north shore.

At the northern end of Chatham sound, nearly abreast port Simpson, there are some clusters of low rocky islets (Connis and Pointers rocks), which render that portion of the sound dangerous to navigation under certain conditions, and divide the sound into two navigable channels (Main and Oriflamme passages).

Chatham sound communicates with Hecate strait by three channels. Edye passage lies in the south-west corner of the sound, and is the channel usually taken. (See page 68.) Brown passage, south of Dundas islands, though comparatively wide, has strong and irregular tides near its western end; and a patch of rocks awash at high water lies nearly in mid channel.

Dixon entrance, the principal, north of Dundas islands, is about 5 miles wide, and is the channel usually taken by vessels proceeding northward along the coast of Alaska.

**Landmarks.**—On the north shore, in the south-eastern portion of Chatham sound, mount Oldfield and mount McGrath, 2,300 and 2,200 feet high respectively, are conspicuous.

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\* See Admiralty plan :—Brown and Edye passages, No. 2,453 ; scale,  $m = 1$  inch.

With the exception of a cluster of bare rocks (Gull rocks) off the mouth of Edyo passage, the islets in that portion of the sound are wooded, of a conspicuous dark colour.

On the South Dundas island, there are four conspicuous peaks, the eastern and highest of which is 1,400 feet high. Northward of Metlah-Catlah, Mission mountain, and Deer mound, of rounded form, will be seen rising from comparatively low land to the height of 1,300 and 2,230 feet respectively.

At 2 miles southward of port Simpson, a mountain of triangular shape with a sharp summit, rises to 1,410 feet, mount Griffin (Waverly peak). South-east of mount Griffin, the ridge has several conspicuous peaks.

Mount McNeil, on the north side of Work channel, has a snow-clad summit, of conical shape, 4,300 feet high.

On the south shore of the sound a conspicuous hill of oval shape (Coast mound) will be seen on Middle Dundas island, with a chain of wooded islets, of a peculiarly dark colour, fringing the shore.

Near the north-east extreme of North Dundas island, Table hill with a flat summit rises to the height of 700 feet, and is conspicuous. Southward of Table hill, a mountain rises to the height of 2,500 feet (Thumb peak). With the exception of one small islet (Grassy islet), the islets and rocks in the northern portion of Chatham sound are bare and conspicuous.

**DANGERS.**—The southern portion of Chatham sound is comparatively free from danger, the rocky clusters being of considerable elevation above high water and moderately steep-to. Northward of Metlah-Catlah bay, however, ledges which uncover at low water extend in many places to the distance of 2 miles from the eastern shore. On the western side of the sound also, there are several off lying detached sunken rocks, with deep water close to them. Abreast port Simpson, two clusters of rocks lie in the fairway of the sound; and being but little elevated above high water, render that portion of the sound dangerous by night or in thick weather.

The several dangers will be referred to in detail. Northward of Metlah-Catlah bay, during a fog, or if uncertain of the position, the eastern shores of Chatham sound should not be approached under 70 fathoms; nor the western shores under 40 fathoms.

**SOUNDINGS.**—The general depths in the southern portion of Chatham sound are from 10 to 66 fathoms, the former depth being obtained upon Alexandra bank nearly in the middle of the sound, northward of Rachel islands. Northward of Metlah-Catlah bay the water deepens. The deep water commences near the south extreme of South Dundas island, and

extends towards the mouth of Big bay, skirting the dangerous ledges which front the eastern shores of the sound. The depths in this portion of the sound are from 54 to 105 fathoms, mud at the latter, and rocky bottom at the former depth. From abreast of Big bay, the deep water extends towards the north extreme of North Dundas island, and widens in extent, occupying nearly the whole of the northern portion of the sound, with depths from 58 to 214 fathoms, mud-bottom, with occasional patches of rock.

**Anchorage.**—Anchorage will be found off the north entrance of Skeena river, in Metlah-Catlah bay, Duncean bay, Big bay, Pearl harbour, and port Simpson, on the eastern side of Chatham sound. Also in Refuge bay (mouth of Edey passage), and in Qlawdzet (north end of Stephen island), on the western side of the sound. These several anchorages will be hereafter described.

#### SOUTHERN PORTION.

**Gull rocks** consist of three principal bare rocks, about half a mile in extent, the highest rock being about 30 feet above high water. These rocks lie off the north entrance of Edey passage, W. by N., distant 3 miles from the north-west extreme of Porcher island (Hunt point), and  $3\frac{1}{2}$  miles from the nearest portion of Prescott island.

**Etrick rock** is a dangerous patch of small extent, which uncovers 3 feet at low water. This rock lies S.E. by E. distant  $1\frac{1}{2}$  miles from the centre of the Gull rock cluster.

**Havelock rock** is of small extent, uncovers 6 feet at low water, and lies S.E. by E., distant  $2\frac{1}{2}$  miles from the centre of Gull rock cluster, and S.W.  $\frac{1}{2}$  W., distant one mile from Hunt point. Both Etrick and Havelock rocks have deep water close to.

**Holland island** is small, wooded, 10 feet high, and lies E. by N.  $\frac{3}{4}$  N., distant  $1\frac{3}{4}$  miles from Green Top islet.

**Kitson island** situated off the mouth of North Skeena passage, is about 2 cables in extent, and lies N.E.  $\frac{1}{2}$  E., distant  $1\frac{1}{2}$  miles from Holland island.

**Green Top island** is small, 15 feet high, with a patch of shrub on its summit. This islet lies N.W. by W.  $\frac{1}{4}$  W., distant  $4\frac{1}{4}$  miles from the western island of the Lawyer group.

**Kinnahan islands** are two in number, about half a mile long, lying close together in a N.W. and S.E. direction. These islands, which lie about one mile from the shore of Tsimpsean peninsula, are wooded, about 200

feet high. The south extreme of South Kinnahan islands lies N.N.W., distant  $1\frac{1}{4}$  miles from Green Top island.

**Rachel islands** (Luk-ōh-witz), consists of two islands, about one mile in extent, in a N.W. and S.E. direction, wooded, and about 200 feet high; lying nearly midway between Tsimpsean peninsula and Stephen island.

The south-eastern extreme of the south-east Rachel island lies N.W.,  $3\frac{3}{4}$  miles from the northernmost Gull rock; and S.W. by W.,  $5\frac{1}{4}$  miles from the south extreme of South Kinnahan island.

**Alexandra patch** is nearly circular, one mile in diameter, within the depth of 20 fathoms. This bank has depths of 10 and 17 fathoms, over a bottom of mud and sand.

The eastern edge of Alexandra patch lies one mile North of the north Rachel island. There are depths of 46 and 50 fathoms, mud, at 5 cables eastward and northward of the Alexandra patch.

**Lucy islands** are a group of islands, and high water rocks; the large islands being wooded, and the small bare. These islands, which lie nearly in the middle of the sound abreast Metlah-Catlah bay, are about one mile in extent in an east and west direction. The summit of the eastern and largest island is 200 feet high, and lies N.W. distant  $5\frac{1}{4}$  miles from the north extreme of the north Rachel island, and S.W. distant  $3\frac{3}{4}$  miles from the south extreme of Tugwell island. This group is of great use when making Metlah-Catlah during thick weather, being comparatively free from danger may be approached, and when made, the easternmost island of the group kept astern bearing S.W.  $\frac{1}{2}$  W., will lead to the entrance of Metlah-Catlah bay.

**A ledge of rocks**, which partially uncover, extends from 4 to 9 cables southward of the Lucy group; the outer rock lying South 9 cables from the summit of the eastern island of the group.

#### EAST COAST.

**TSIMPSEAN PENINSULA** separates Skeena river from Work channel, being barely half a mile wide abreast the mouth of Skip river.

This peninsula (which takes its name from a tribe of Indians residing upon it) is nearly 32 miles long, in a general north-west and south-east direction, with a greatest breadth of 9 miles.

The head-quarters of the tribe of Indians inhabiting this peninsula are at Metlah-Katlah and port Simpson.

**METLAH-CATLAH.\***—Tugwell island lies about 2 miles south-westward of Metlah-Catlah village, and vessels desirous of communicating with that place usually anchor off the eastern side of Tugwell island, or off its northern side in Duncan bay, according to circumstances. Tugwell island is about  $1\frac{1}{4}$  miles long, in a north and south direction, with an average breadth of half a mile, and is fringed by dangerous rocky ground, especially on its south eastern side. The island is wooded (the tops of the trees being about 200 feet high), and is connected at low water with Mission point upon which Metlah-Catlah village stands.

**Dawes rock** is awash at low water, and lies S.S.W.  $\frac{1}{2}$  W., 4 cables from the south extreme of Tugwell island (Dawes point). Between Dawes rock and Dawes point, large boulder rocks uncover at low water, and extend along the western side of Tugwell island.

**Enfield rock** has 5 fathoms water upon it; and lies S.S.W.  $\frac{1}{2}$  W., distant one mile from the south extreme of Tugwell island.

**Clearing marks.**—Carr islet, just shut in with the western extreme of Devastation island bearing N. by E. northerly, will lead eastward of the foul ground off the south-eastern part; and the south extreme of the large Cridge island seen in line with Quartermaster rock, and touching the north extreme of the small Cridge island bearing E. by N., will lead southward of the dangers off Tugwell island.

**Alford reefs** are a dangerous cluster of rocks, about 3 cables in extent north and south, lying at the mouth of Metlah-Catlah bay. The northern rock, which uncovers 2 feet at low water, lies N.W. by W., distant 6 cables from Quartermaster rock.

The south extreme of the large Cridge island, in line with Quartermaster rock, bearing E. by N., will lead southward of the Alford reefs; Carr islet just shut in with western side of Devastation island bearing N. by E. northerly, will lead westward; the summit of Knight islands kept midway between Pike and Shrub islands, bearing N.N.E.  $\frac{1}{4}$  E., will also lead westward; and the flagstaff on Mission point (Metlah-Catlah village) in line with the western extreme of Pike island bearing N. by E., will lead eastward of Alford reefs.

**Quartermaster rock** is a small black rock, 2 feet above high water, lying W. by S. distant 4 cables from the south extreme of the large Cridge island, and  $1\frac{1}{2}$  cables from the small Cridge island, on the same bearing.

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\* See Admiralty plan:—Metlah-Catlah bay, No. 364; scale,  $m = 3$  inches.

**A rock**, which uncovers one foot at low-water, lies South, distant  $1\frac{1}{2}$  cables from Quartermaster rock.

**Cridge islands** are two in number, and lie at the south-east entrance of Metlah-Catlah bay. The eastern and larger island is 150 feet high, and lies 2 cables from the eastern shore of the bay (Digby islands). The western island is small, 100 feet high, and lies W. by S., distant 2 cables from the south extreme of the larger Cridge island. Both islands are wooded.

**Midge rock** is a patch of small extent, which uncovers at low water, and lies North distant 5 cables from Quartermaster rock; and about 6 cables north-eastward of Alford reefs.

**Devastation island** lies half a mile eastward of Tugwell island, and is nearly one third of a mile long, north and south, and 200 yards broad. This island is wooded, 150 feet high, with two rocky islets lying close to its south extreme.

The western shore of Devastation island has no danger off it beyond the distance of half a cable. From the northern extreme of this island, however, a shoal, portions of which uncover at low water, extends 5 cables in a north-easterly direction towards Pike island.

**Knight island** is small, with stunted scrub upon it, barely 10 feet high. This island lies E.  $\frac{3}{4}$  S. distant 4 cables from the north extreme of Devastation island.

**Armour rock**, with 9 feet water over it, lies S.E. by S. distant one cable from Knight island.

**Pike island**, 100 feet high, is about one third of a mile long in a north and south direction. This island is wooded, and its south extreme lies N.E. distant 7 cables from Devastation island.

**Carr islet** is small, about 60 feet high, its summit lying N. by E. distant 5 cables from the north extreme of Devastation island. A small islet lies N.W. 2 cables from Carr islet. Carr islet is connected at low water with the spit which joins Tugwell island and Observation point.

**Shrub islet** lies N. by E. distant  $1\frac{1}{2}$  cables from the north side of Pike island, and is of small extent.

**A shoal**, the outer portion of which uncovers at low water, extends nearly 2 cables from the north side of Shrub islet; and is the outer portion of a bank of sand, with patches of rock upon it, which connects Pike island, Shrub islet, Gribbell and Isabel islands at low water.

**A ledge of rocks** which uncovers at low water, extends  $1\frac{1}{2}$  cables south-east of Observation point.

**Kelp rock** is a dangerous sunken rock, which lies nearly midway between Shrub islet and Observation point, distant 2 cables from either. The navigable channel between Shrub islet and Observation point, is contracted by Kelp rock to barely half a cable in width at low water.

**Mission point** lies N.E. by E.  $\frac{1}{2}$  E. distant three-quarters of a mile from Observation point.

**Gribbell island**, situated on the south side of the channel leading into Venn creek, is about the same size as Shrub islet, from which it is distant 5 cables in a north-easterly direction. A small rocky islet lies about half a cable off the north side of Gribbell island.

**Isabel island**, lies N.N.E. distant  $1\frac{1}{2}$  cables from the summit of Gribbell island, and South  $1\frac{3}{4}$  cables from Mission point.

A dangerous sunken rock lies half a cable westward of Isabel island, and reduces the navigable channel at low water to barely 60 yards in width.

**Venn Creek** lies in an E. by S. direction from Mission point, but is only suitable for small vessels. There are several fishing stations upon the shores of this creek, in which the Indians obtain salmon.

**Anchorage** will be found in 11 to 12 fathoms, mud, 3 cables off the western side of Devastation island; with the south extreme of Devastation island seen in line with the smaller Cridge island, bearing S. E. by S. and the south extreme of Carr islet seen in line with the flagstaff on Mission point, bearing N. E.  $\frac{1}{4}$  N. Small vessels occasionally proceed into Venn creek and anchor off Metlah-Catlah village, in 10 to 12 fathoms, with the flagstaff on Mission point bearing W. by S. distant 3 to 4 cables.

The channel into this anchorage is barely 60 yards wide at low water, when the dangers on either side indicate themselves, but the passage should only be attempted by short vessels, of light draught; and even when under the guidance of a pilot, it would be well to place boats either upon Kelp rock, or upon the outer edge of the shoal off Shrub islet, and also upon the rock which lies westward of Isabel island.

For all ordinary purposes, however, the anchorage off Devastation island is within easy distance for communicating by boat with Metlah-Catlah mission.

**DUNCAN BAY** lies on the north side of Tugwell island, and affords anchorage when desirous of communicating with Metlah-Catlah during the prevalence of south-easterly winds.

This bay at its entrance between the north extreme of Tugwell island and Ryan point is about  $1\frac{3}{4}$  miles wide, and takes an easterly direction for about  $1\frac{1}{2}$  miles, terminating in the sandspit which connects Tugwell island and Tsimpsean peninsula (Observation point) at low water.

**Dangers.**—A shoal with 3 fathoms (and probably less water) upon it extends 5 cables northward of Tugwell island. Ledges, which uncover, and sunken rocks, extend nearly 7 cables from the north shore of Duncan bay.

**Hecate rock** lies near the head of Duncan bay, 3 cables from the north shore of the bay. This rock has only 10 feet water upon it.

**Directions.**—If desirous of anchoring in Duncan bay, pass one mile north-westward of Tugwell island, and when the south extreme of Gribbell island is seen just open of Observation point, bearing E.  $\frac{1}{2}$  S., that mark should be steered for; and a berth taken up on that bearing, in 8 to 10 fathoms, mud, with the north-west extreme of Tugwell island (Chapman point) bearing S.W. by W.

Approaching Metlah-Catlah from the south-eastward, if the Lawyer group of islands be kept in line with Green Top island bearing S.E. by E.  $\frac{1}{2}$  E., that mark astern will lead directly to the entrance of Metlah-Catlah bay; and having brought Carr islet in line with the western side of Devastation island, a vessel may steer in on that mark, and proceed as before directed to the anchorage off the north west side of Devastation island. Or if bound into Duncan bay, should pass one mile westward of Tugwell island, and proceed as before directed. During a fog or in thick weather, when approaching Metlah-Catlah from the south-eastward, do not shoal to less than 40 fathoms, and on such occasions the Lucy islands should be cautiously steered for and made, taking care to avoid the reefs which extend from the south side of the group. The large or eastern Lucy island should be brought to bear S.W.  $\frac{1}{2}$  W. astern, and a N.E.  $\frac{1}{2}$  E. course should take a vessel to the mouth of Metlah-Catlah bay. The bank of 10 fathoms and less water extends nearly one mile to the southward of Tugwell island, and the hand lead, if proceeding slowly, should indicate its position. During summer and autumn large quantities of kelp grow upon this bank.

**Metlah-Catlah Village**, is a missionary station, situated upon Mission point. The houses forming the mission stand upon an elevated bank, about 100 feet above high water mark. Most of the houses are whitewashed, and the whole settlement from the offing presents the appearance of a picturesque English village.

The most conspicuous buildings are the church, schoolhouse, and mission house.

The young natives, most of whom speak English, are taught trades, and for this purpose there are carpenter's and blacksmith's shops, saw mills, and a soap factory. The women are taught sewing and other useful



employments. Patches of ground are cultivated and potatoes of large size and good quality are grown.

**Population.**—It is difficult to ascertain correctly the population of any Indian settlement; detached parties are so often away hunting and fishing. It was estimated, however, that the population of Metlah-Catlah numbered over 1000 in the year 1870.

**Tides.**—It is high water, full and change, at Metlah-Catlah at Noon; springs rise 21 feet.

**Observation point,** about half a mile westward of the village, is in latitude  $54^{\circ} 20' 10''$  N., longitude  $130^{\circ} 27' 30''$  W.

**TREE BLUFF,\*** the south entrance point of Big bay, lies N.N.W.  $\frac{1}{2}$  W., distant 5 miles from Ryan point, the north entrance point of Duncan bay. The shore northward of Ryan point is low and wooded to the distance of 3 miles back from the coast. There it rises into high land; the two most conspicuous mountains being Mission mountain and Deer mound before mentioned. Two streams empty themselves on this part of the coast, and there are two islets lying close to the shore, respectively one and 2 miles northward of Ryan point. The former (Swamp islet), is covered with low grass, and lies about 5 cables off shore. The latter islet is bare (Slippery rock), about 4 cables from the shore.

Immediately seaward of Tree bluff, there is a wooded hill, close to the shore, 250 feet high.

**DANGERS.**—Between Metlah-Catlah and Big bays, dangerous ledges extend off shore in many places to the distance of 2 miles. These ledges uncover at low water, and are steep-to.

**HODGSON REEFS** are a dangerous cluster of reefs which lie northward of Duncan bay. The south portion of these reefs, which uncovers at low water, lies N.W., distant 2 miles from the N.W. extreme of Tugwell island, and W.N.W.,  $1\frac{3}{4}$  miles from Ryan point. From that position, dangerous sunken rocks extend in a N.N.W. direction for 2 miles.

Abreast Tree bluff the edge of the bank, which dries at low water, lies  $1\frac{1}{2}$  miles from the shore.

The south side of Kinnahan islands, just showing clear of the south end of Tugwell island bearing S.E.  $\frac{3}{4}$  E., leads westward of Hodgson reefs, and the eastern island of the Lucy group should not be brought to

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\* See Admiralty plan:—Big bay and adjacent anchorages, No. 2426; scale,  $m = 3$  inches.

bear south of S. by E. astern until mount Griffin (over port Simpson), is seen in line with the north end of Burntcliff island N. by E.  $\frac{1}{2}$  E., this mark leads westward of all dangers at the mouth of Big bay.

**BIG BAY\*** (**Lak-Hou**) lies immediately northward of Tree bluff. At its entrance between Tree bluff and South island this bay is  $2\frac{1}{2}$  miles wide, and takes an easterly direction for  $3\frac{1}{2}$  miles. The head of the bay, into which several streams empty themselves, is fronted by a sand flat, which uncovers, to the distance of one mile from the shore at low water.

**South island**, situated at the north-west entrance of Big bay, is small and wooded, with a sharp summit 50 feet high.

**Haycock island** lies East 3 cables from the summit of South island.

**White Cliff island** lies E.  $\frac{1}{2}$  S., distant 9 cables from Haycock island; it is small, and terminates in high white conspicuous cliffs.

**Shattock point** lies E.N.E., distant 3 cables from White Cliff island, and is the north-west entrance point of Salmon river bight.

**Swallow island** lies E.  $\frac{3}{4}$  S., distant one mile from Whitecliff island, and one cable from the north shore.

**Curlew rock** is small, about 2 feet above high water, and lies South distant 5 cables from Swallow island.

**Salmon river bight** is the name of the bight at the head of Big bay. At low water the head of the bight dries as far out as Curlew rock.

**Ripple bank** is about 2 cables in extent, within the 5 fathoms line, and lies in an East and West direction. The shoalest portion of the bank, near the eastern end, has 12 feet water over it, sandy bottom, and lies S. by W.  $\frac{3}{4}$  W.  $1\frac{1}{10}$  miles from the summit of South island. This bank usually indicates itself by a tide rip, but no kelp was growing upon it in the autumn of 1868.

**A ledge of sunken rocks**, with depths of 6 and 12 feet, extends S.  $\frac{1}{2}$  W. 5 cables from the south side of South island.

**A sandbank**, about a cable in extent, with 3 fathoms water, lies S.  $\frac{1}{2}$  E., 3 cables from Whitecliff island.

**Escape reefs** are a dangerous cluster of reefs lying at the mouth of Big bay. The outer or western reef has 4 feet water over it, and lies S.  $\frac{1}{2}$  W. distant  $1\frac{4}{10}$  miles from the summit of South island. The eastern

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\* See Admiralty plan:—Big bay, on sheet No. 2426.

reef has 5 feet water over it, and lies E.N.E. distant 5 cables from the western one. There are depths of 16 and 17 fathoms between these reefs. During the season of kelp growth, that weed is found in great quantities upon Escape reefs, and near the head of Big bay.

**Anchorage** will be found in Big bay, in 11 and 12 fathoms, mud, with Haycock island in line with the north extreme of South island, bearing N.W. by W.  $\frac{3}{4}$  W., and White Cliff island in line with mount Griffin, bearing N. by W.  $\frac{1}{4}$  W.

**Directions.** -- Approaching Big bay from the southward, mount Griffin should be kept in line with the north extreme of Burnt cliff island N. by E.  $\frac{1}{4}$  E. until Sharp peak on the ridge south-east of mount Griffin is in line with the south end of Swallow island bearing E. by N.; the latter mark will lead directly into Big bay; anchor with Sharp peak open south of Swallow island, in the position and depth above given.

**Burnt cliff island**, situated northward of South island, is about half a mile long in a N.W.  $\frac{1}{2}$  N. and S.E.  $\frac{1}{2}$  S. direction, and wooded, its highest point near its north end being 200 feet high, the north extreme of this island terminates in high red-brown cliffs, the north-east extreme is cultivated; and from that point a long bank of shingle, awash at high water, extends 3 cables in a north-easterly direction. The whole space inshore of South and Burnt cliff islands, uncovers at low water.

**A ledge**, which uncovers at low water, extends 3 cables in a north-easterly direction from the north-west extreme of Burnt cliff island. The channel between Burnt cliff and One Tree islands is available only for boats.

**One Tree island**, situated 4 cables north-west of Burnt cliff island, is of small extent, with a sharp wooded summit 150 feet high. A low grassy neck extends 100 yards in a northerly direction from the north extreme of One Tree island; at the extremity of this grassy neck a high conspicuous solitary tree was standing (1868).

**A ledge**, which uncovers at low water, surrounds One Tree island; its greatest distance off shore being  $2\frac{1}{2}$  cables in a N.N.W.  $\frac{1}{2}$  W. direction from the single tree.

**Flat top islands** are a group lying to the northward of One Tree island. This group consists of three wooded islands, lying N.N.E. and S.S.W. of each other. The middle and longest island of the group is connected by a narrow grassy neck with the northern island, and the latter has a flat summit, covered in July with long grass; also a single stunted

tree growing upon it (1868). The southernmost and smallest Flat top island lies N. by E., distant  $3\frac{1}{2}$  cables from the tree on One Tree island.

Ledges, which uncover at low water, and foul ground surround the Flat top group to the distance of  $1\frac{1}{2}$  cables.

**FINLAYSON ISLAND**, the largest in this vicinity, is  $2\frac{3}{4}$  miles long in a N.W.  $\frac{1}{2}$  N. and S.E.  $\frac{1}{2}$  S. direction, and one mile broad, 200 feet high, and wooded. The south extreme of the island terminates in cliffs; but the north extreme (Gordon point) is long and comparatively low, with ledges which uncover extending 2 cables to the northward; and on the north-west side of the island, about half a mile from the north-west extreme, a large stream empties itself.

**Red Cliff point**, situated on the eastern side of Cunningham passage, N.E. 5 cables from Fortune point, is rendered conspicuous by the high red-brown cliffs over it; and the small islet close to. Immediately south-east of the point there is a bay, with a sandy beach, and stream at its head.

**PEARL HARBOUR**,\* situated eastward of One Tree island, is nearly circular in shape, with a diameter of 5 cables. The eastern side of the harbour is formed by a bay, which uncovers nearly throughout at low water. On its south-east side, the high bank of shingle which extends from the north-east point of Burnt cliff island, effectually shelters the harbour from south-easterly winds.

**Anchorage**.—Good anchorage will be found in 9 to 10 fathoms, mud, near the middle of Pearl harbour, with Fortune point seen just open northward of the southernmost island of Flat top group, bearing N.W.  $\frac{1}{2}$  W., and the trees on One Tree island, W.S.W., distant 3 cables.

**Otter anchorage**, situated at the south end of Cunningham passage, near the eastern shore, northward of Flat top islands, is useful if communicating with the wood-cutting establishment abreast it.

Anchorage in 15 to 17 fathoms, sand, will be found with the centre of the wood-cutting establishment in line with Leading peak, bearing E. by N.  $\frac{1}{4}$  N., and the northernmost Flat top island (Green mound) S. by E., distant  $1\frac{1}{2}$  cables.

**Wood-cutting establishment**, from which the principal supplies for port Simpson are obtained, lies near the middle of a sandy bay,

\* See Admiralty plan:—Pearl harbour, on sheet No. 2426.

the northern point of the bay terminating in cliffs. The bay dries nearly throughout at low water.

From Otter anchorage there is a passage eastward of Flat Top islands into Pearl harbour, but this is not recommended to a stranger.

**SPARROWHAWK ROCK**, a dangerous, sunken, pinnacle rock, with 5 feet water, lies N.W.  $\frac{1}{2}$  N., distant nearly 5 cables from the tree on One Tree island. This rock, which was found by H.M.S. *Sparrowhawk* striking it in 1866, lies nearly in mid-channel, between One Tree and Finlayson islands, and is steep-to, there being depths of 10 and 12 fathoms at the distance of 50 feet from it.

A well defined peak of triangular shape, the first to the south-east on the ridge from mount Griffin (Leading peak), in line with the stunted tree on the northernmost islet of the Flat top group bearing E. by N.  $\frac{1}{2}$  N., or that peak seen just open southward of the wood-cutting establishment abreast Otter anchorage, E. by N.  $\frac{1}{4}$  N., will lead northward of Sparrowhawk rock.

**Dodd Rock** is the most outlying danger extending from the south side of Finlayson island, and lies South a little over 2 cables from Fortune point, with ledges which uncover between it and that point. Dodd rock only covers at the highest equinoctial tides, and is therefore a useful mark when entering Cunningham passage, as there is deep water a short distance southward of the rock.

Leading peak seen just open southward of the wood-cutting establishment abreast Otter anchorage, bearing E. by N.  $\frac{1}{4}$  N., will lead southward of the Dodd rock.

**Directions.**—Approaching Cunningham passage, Red Cliff point should be steered for in line with Fortune point, bearing N.E., until Leading peak is seen in line with the stunted tree on the north Flat top island (Green mound), bearing E. by N.  $\frac{1}{2}$  N., when the latter mark should be steered for. When the southern side of Burnt cliff island is seen open northward of the tree on One Tree islet, bearing S.S.E.  $\frac{1}{2}$  E., a vessel will be eastward of Sparrowhawk rock; and if bound to port Simpson, may haul to the northward into Cunningham passage.

If bound into Pearl harbour, a mid-channel course from the above-mentioned position should be shaped between One Tree islet and the southernmost Flat top island. Two conspicuous wooded points on the eastern shore (Belletti and Shattock points) should be seen in line, bearing S.E. by E., when entering Pearl harbour.

**CUNNINGHAM PASSAGE**, situated eastward of Finlayson island, lies in a N. by W.  $\frac{1}{2}$  W., and S. by E.  $\frac{1}{2}$  E. direction.

The southern portion of this channel is barely  $3\frac{1}{2}$  cables wide. But northward of Sarah point (the north-east extreme of Finlayson island) the passage widens out, attaining between One Tree islet and Gordon point a width of  $1\frac{1}{4}$  miles. The depths in mid-channel are from 16 to 36 fathoms, with no danger beyond a cable from the shore until nearing Village island.

**Village island**, situated at the south-west entrance of port Simpson, about a cable from the shore, with which it is connected at half tide, is about a quarter of a mile long, in a W.N.W. and E.S.E. direction; its south side forms a bay; and following the trend of that bay and round the southern extreme of the island, the houses of one of the Tsimpsean villages will be seen. Village island near its north-west extreme is about 50 feet high, having on it a high pole.

**One Tree islet** is about 100 yards long east and west, lying close to the north-west extreme of Village island. Near the western end of this islet stands a conspicuous decayed tree.

**Birnie island** lies at the north-west entrance of port Simpson, and is three-quarters of a mile long in a north and south direction, and a little over 2 cables broad, with a greatest elevation near the middle of the island of 330 feet. The shores of this island are comparatively bold and unbroken. Knox point, the south extreme of Birnie island, lies North  $1\frac{1}{2}$  miles from Finlayson island; and N.W.  $\frac{3}{4}$  W.  $1\frac{3}{4}$  miles from One Tree islet. Ledges which uncover at low water extend one cable from Knox point.

**PORT SIMPSON\*** is the most spacious harbour on this part of the coast. At its entrance between One Tree islet and Birnie island, it is nearly  $1\frac{1}{2}$  miles wide; thence it takes an easterly direction for about  $3\frac{1}{2}$  miles, contracting gradually as the head is approached; and terminating in a narrow bight, named Stumaun bay. Stumaun bay dries across at low water. At its head are several streams, where the salmon, from which it derives its name, are caught.

**Landmarks.**—The villages on Village island, the decayed tree on One Tree islet, fort Simpson, and mount Griffin, with its triangular summit, are all conspicuous objects at the south-west entrance of port Simpson. On the north shore, two hills of nearly the same height 870 feet (George and Lizzie hills), are wooded and easily recognised. The mouth of a lagoon, on that shore, is also conspicuous. Ben hill, over

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\* See Admiralty plan:—Port Simpson, on sheet No. 2426; scale  $m = 3$  inches.

the south entrance point of Stumaun bay is wooded, 130 feet high, and conspicuous amid the adjacent low land.

**Soundings.**—The greatest depth in port Simpson is 29 fathoms; but the average depths near the anchorage ground are from 12 to 18 fathoms, mud.

**Anchorage.**—The usual anchorage lies off the fort, in about 10 fathoms, mud, a good berth is, with Parkin islands, seen just open northward of Birnie island, bearing N.W. westerly, and the north-west extreme of Finlayson island (Gordon point) in line with the decayed tree on One Tree islet, W.S.W.

**Hankin reefs** are a dangerous cluster of reefs which partially uncover, situated south-west of Village island. The south-west extreme of these reefs, uncovers 6 feet at low water, and lies S.W. by S., distant a little over 3 cables from the north-west extreme of Village island. There is deep water between these reefs and Village island.

The south-east extreme of Finlayson island (Fortune point), just shut in with the north-east extreme of that island (Sarah point), bearing S. by E.  $\frac{1}{2}$  E. leads westward, and the mouth of the lagoon on the north shore of port Simpson, seen open of One Tree islet, N.E., leads northward of Hankin reefs.

**Harbour reefs** are an extensive plateau of rocks, awash at high water, which form a natural breakwater at the mouth of port Simpson, and protect the anchorage from N.W. winds. This sunken plateau is nearly square in shape, and about one mile in extent, within the depth of 5 fathoms. The south-east portion of these reefs only covers at the highest tides, and lies W.N.W.,  $2\frac{1}{2}$  cables from One Tree islet.

The mouth of the lagoon on the north shore of port Simpson, seen just open westward of One Tree islet, bearing N.E.  $\frac{1}{4}$  N., leads south-eastward; Lizzie hill seen well open southward of Birnie island, leads north-westward; Ben hill open north of Bath point (south-east shore of port Simpson), E. by S., leads northward; and Parkin islands seen open of the north extreme of Birnie island, N.W. (westerly) leads north-eastward of Harbour reefs.

**Dodd passage** lies between One Tree islet and Harbour reefs, and is 2 cables wide, with depths of 6 and 8 fathoms in it. This is available for steam vessels, but local knowledge is necessary.

**Anchorage patch**, with 18 feet water, sandy bottom, lies in the western portion of the anchorage ground off fort Simpson, with the Fort gate bearing S.E.  $\frac{1}{2}$  E., and the pole on the N.W. extreme of One Tree islet, S.W., distant  $1\frac{1}{2}$  cables.

**Choked passage**, situated northward of Birnie island, has several ledges which uncover, and sunken dangers with deep water between them.

This passage should not be attempted except in boats, and when using it keep near the north shore.

**Directions.**—Approaching port Simpson from the southward, by Cunningham passage the cliffs on the north-west extreme of Burnt-cliff island kept in line with the southernmost Flat top island, bearing S. by E.  $\frac{1}{2}$  E. astern will lead through, until abreast Sarah point. Thence the mark for leading westward of Hankin reefs should be brought on astern, and when the lagoon mouth on north shore of port Simpson opens westward of the decayed tree on One Tree islet, bearing N.E.  $\frac{1}{4}$  N., a course should be steered to pass one cable north-westward of One Tree islet, and anchor in the position before mentioned.

A vessel not wishing to enter by Dodd passage, should when abreast Sarah point bring that point in line with the south point of a bay on the eastern shore of Cunningham passage, bearing S.E.  $\frac{1}{4}$  E. astern, which mark will lead southward of the Harbour reefs, midway between that danger and Finlayson island.

**Inskip passage**, the northern and principal entrance into port Simpson, is a little over 5 cables wide. This should be used by a stranger. The depths in this channel are from 11 to 20 fathoms.

Entering port Simpson by Inskip passage Lizzie hill on the north shore bearing N.E., will lead 2 cables south-east of Birnie island. When Bath point is in line with Ben hill (south shore of the bay) bearing E. by S., an E. by N. course may be steered, until Parkin island is seen just open northward of Birnie island, bearing N.W. (westerly), that mark kept on astern will lead up to the anchorage, in the depth and position before mentioned.

**Fort Simpson** was formed by the Hudson Bay Company in 1831 as a trading post, on account of the good anchorage found in its vicinity and the facilities afforded to sailing vessels. The trading post or fort stands near the south-west entrance point of the bay, close to the beach. This stockade is of oblong shape, 250 feet long and 100 feet deep, with high bastions. The ground timbers were originally of pine, but are now of cedar wood, a sleeper of the latter timber having been found to be quite sound 20 years after it was laid down, when all the pine wood sleepers laid at the same time were found to be rotten. The fort when seen from seaward presents a strong and compact appearance, and upon inspection its palisades will be found to be scarred by bullet marks, bearing evidence of the many sieges it has sustained from the natives. A large entry gate faces the beach with a landing jetty of stones in front of it. Within the fort are five large buildings, forming the dwellings of the Hudson Bay Company's officers, the trading stores, and a store for furs awaiting shipment. The fort stands near the beach, and flanking it and extending back some 300 feet, is a palcd space of about 6 acres in



extent. The eastern portion of this space is a well cultivated garden, and excellent potatoes, lettuces, and radishes are grown, the first of the season of the latter appearing in 1868, on the 20th June. Raspberries and strawberries grow in abundance, the former being of large size and good flavour.

The land at the back of the fort is about 130 feet high, and has been cleared to the distance of about a mile. The surface, however, is covered with thick moss, saturated with moisture, which renders walking unpleasant and difficult.

The Hudson Bay Company's trading steam-vessel calls periodically at port Simpson, bringing supplies and returning with the furs.

The principal furs obtained are:—Sea otter, land otter, bear, beaver, lynx, silver fox, red fox, fisher, wolf, fur seal, hair seal, wolverene, racoon, musk rat, mink, marten, and ermine.

**Temperature.**—From observations taken in 1868, during the four months mentioned, the maximum and minimum registrations of temperature were as follows:—June, 65°, 50°; July, 74°, 48°; August, 70°, 54°; September, 64°, 44°.

**INDIAN VILLAGES.** — Before the Hudson bay post was built, the villages of the Tsimpsean Indians were at Metlah-Catlah, but the tribe being great traders, as well as hunters, travelling long distances inland, they naturally migrated nearer the trading post. They have therefore settled along the beach on either side of the fort, and upon an island close opposite (Village island). Village island was formerly only connected with the main at low water, but the Indians have constructed a trestle bridge, about 600 feet long and from 15 to 20 feet high, connecting the island and the main (Hay point). In 1868 there were 18 houses on the beach eastward of the fort, 49 houses westward, and 66 dwellings upon Village island. Most of the houses were strong and well built, about 30 feet long, 20 to 30 feet deep, and from 15 to 20 feet in height, with a wide door facing the beach. Along the beach canoes of large size were hauled high up, close to the dwellings. In front of the houses high poles are erected, with grotesque carvings upon them, principally representing a human face, with the wings of a large bird attached to it, and frequently crowned by the figure of a bird with a long bill. The minor carvings are generally associated with the family crest, each chief and clan having a crest, the principal ones being the whale, porpoise, eagle, raven, wolf, and frog. Red and green are the predominating heraldic colours.

**Population.** — Like the other coast tribes, the Tsimpseans are decreasing in numbers annually, but in 1868 they numbered about 2,000.

**Supplies.**—Salmon, berries, shell fish, houlikan oil, and dried seaweed form the principal diet of these Indians. Animal food (Venison) is eaten when it can be obtained. But the winter food consists of dried salmon and

houlikan oil. The salmon are caught in immense quantities during the autumn and smoked over wood fires in huts. Houlikan abounds in Nass river in the spring, the banks at low water being covered with dead fish. From this fish, which is larger and rounder than a sprat, a nutritious oil is extracted, and is the principal support of life to this people. The various tribes whose rivers the houlikan do not visit, buy the oil in exchange for furs. The seaweed is taken in great quantities on the off-lying rocks during the low autumnal tides. It is dried and compressed into cakes and used as winter food. A great luxury with them is rice and molasses.

Wood, water, potatoes and crabs, can be obtained in port Simpson.

**Customs.**—The Tsimpseans were once a powerful and warlike tribe, nearly always at war with either the Hydahs (Queen Charlotte islands) or the Nass Indians (Portland inlet), and much dreaded by the Bella Bella and southern tribes. They are still an influential race and object to any other tribe trading directly with the Hudson bay company at fort Simpson. Before granting permission for such, they expect and obtain presents.

On such occasions feasts are held. A spirit called whiskey is drunk, and under its influence they commit many crimes. Without any apparent cause, old grievances are recalled, and as they invariably have their fire-arms beside them, they shoot one another.\*

**Slavery** is reported to be still (1868) in existence among them. In the event of a feast terminating in murder, the aggrieved tribe sally forth in their canoes, and meeting any of the tribe of the murderer, carry the women away, first killing the men.

**Chiefs.**—The head of the Tsimpsean tribe in 1868 was a woman.

**Sick people** are kindly treated, and receive much attention from their friends. Upon the appearance of an epidemic, however, such as small-pox, this rule does not apply. So great is their dread of this disease, that those suffering from it are at once taken outside the village, a fire is lighted, some food is placed beside the sufferer, and he is then left to his fate.

The women mourn for the dead many days, they sit on the beach and utter a long, low, dismal wail. The dead are usually burnt. Mr. Duncan says, "the corpse is conveyed away in a canoe to a distant part of the beach and there burned to ashes. Mourners accompany it and they make the air to ring with their piercing cries all the time the body is consuming. The ashes are then collected and placed in a little house appointed to receive them. A slave, after death, is at once placed in a canoe, and thrown into the harbour, without any sorrow being expressed."

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\* It is advisable for white men, if strangers, not to visit the villages on those occasions.

**Religion.**—This branch of the Tsimpsians are not like that at Metlah-Catlah, Christians. Some native Christians, however, teach in a mission house. But the great bulk of the population adhere to their old customs and ceremonies.

**Language.**—The Tsimpsian language is soft and melodious; it is spoken as far south as Wright sound. Eastward of that sound the Bella Bella dialect is spoken; the Kit-i-mat tribe (at the head of Douglas channel) speaking a mixture of both dialects.

The language of trading, and for communication generally between tribes speaking different dialects, is called Chinook. This jargon consists of English, French, and Indian words strung together, with no grammatical basis. It is readily acquired, and almost universally spoken by the coast tribes from the Columbia river to Alaska.

**Repairs.**—The great rise and fall of tide at port Simpson permits a vessel to be beached. A good site will be found for this purpose just westward of the fort. The bottom consists of hard sand, with a covering of weeds. The surveying vessel "*Beaver*" was beached in this position in 1868, and did not sink into the ground beyond one inch.\*

**Climate.**—The climate at port Simpson is uncertain, no two seasons being precisely the same, or appearing to follow any general law.

During one summer fine weather may be experienced for six weeks at a time, and on such occasions a serene atmosphere, with magnificent sunsets, will be experienced. The following summer may prove one of almost constant rain, with a succession of gales from the south-eastward. Along the shores of Chatham sound the rainfall is not so great as within the inlets. The temperature during July, and August 1869 varied from 57° to 64°; during June, July, and August 1868 it varied from 48° to 73°. The mean temperature of the sea was 4° lower than the mean temperature of the atmosphere at port Simpson during these periods, but at Metlah-Catlah and Nass bay it was 8° lower than the atmosphere, probably due to the influence of the cold water from the rivers which flow into those bays.

**Birds.**—During the month of May humming birds in great numbers arrive, and remain until the end of August. They are snared by the Indian boys, and brought alongside for sale, suspended to sticks.

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\* H.M.S. *Virago* was repaired on the beach opposite the fort in 1853. The vessel was lightened to 11 ft. 6 in. forward, and 12 ft. 6 in. aft, the stores with the exception of the guns and cables being lodged in the fort. On the 22nd June, during the night tide, the vessel was warped into her position, and remained there until the 8th July during which time, the gripe and fore part of main keel (26 feet long) was repaired, and 65 sheets of copper replaced on various parts between the bilge and keel. The night tides were about 3 feet higher than the day.

At the beginning of October, large flocks of wild geese, and ducks, are seen flying southward; and the winter season is then assumed to have commenced.

**Tides.**—It is high water, full and change, at port Simpson at 11. 30m.; springs rise 17 to 22 feet; neaps 14 to 17 feet.

**Observation spot** is on the north-west extreme of Village island; in latitude  $54^{\circ} 33' 51''$  N., longitude  $130^{\circ} 26' 36''$  W., depending on Shell island, Beaver harbour, being in  $127^{\circ} 25' 7''$  W.

**Deviation.**—For swaging to ascertain the deviation of the compass in port Simpson, Table hill on Dundas island is 12 miles distant, and conspicuous. The bearing of the nob at the north end of Table hill, from the anchorage in port Simpson is N.  $76^{\circ} 00'$  W. (true).

**Parkin islands** consist of two islands lying close together, about a cable in extent in a N.W. and S.E. direction. These islands, though small, are 250 feet high, wooded and conspicuous. The south extreme of Parkin islands lies N.W.  $\frac{1}{4}$  N. distant about  $1\frac{1}{2}$  miles from the north extreme of Birnie island, and 6 cables from the nearest shore (Black point).

**Maskelyne point**, the south-west entrance point of Portland inlet, and the north-west entrance point of Work channel, lies S.E.  $\frac{1}{2}$  S., distant 3 miles from Wales point. Vancouver obtained the depth of 8 fathoms, soft bottom, half a mile from point Maskelyne. Deep water was found within a cable of that point (1868).

**Work channel**, the entrance of which lies close northward of point Maskelyne, takes a south-easterly direction. This channel has not been examined in detail since the visit of Vancouver. At its entrance it is barely 4 cables wide, which width it preserves for about 7 miles, when it widens to  $1\frac{1}{2}$  miles, and afterwards to 2 miles. Near its termination, Work channel divides into two arms, one taking a north-easterly direction, the other continuing to the south-east. Its shores are stated by Vancouver to be "straight and compact."

#### WEST COAST.

**Prescott and Stephen islands** lie in the south-western part of Chatham sound, and are separated by a narrow passage available only for boats. These islands together are about 12 miles long in a W. by N. and E. by S. direction, of triangular shape, the base of the triangle being 4 miles long, and forming the north-west side of Stephen island.

Prescott island has an elevation of 820 feet. Stephen island attains an elevation of 1,340 feet near its east end; its southern shores are comparatively low, with some white cliffs near the centre.

**Tree-nob groups** are a labyrinth of islands, islets, and rocks awash at low water, which extend 6 miles in a north-westerly direction from the N.W. side of Stephen island. The larger islets are wooded, and the smaller bare. Vancouver, who nearly met with disaster among them, describes them as "an intricate inhospitable labyrinth."

**EDYE PASSAGE**\* lies on the south side of Prescott and Stephen islands, and is the channel usually taken when communicating between Chatham sound and Hecate strait. By using it, vessels avoid the strong and irregular tides met with in Brown passage. It is comparatively free from danger, and at its northern end possesses an excellent anchorage (Refuge bay), in which a vessel may await a favourable opportunity for proceeding.

**Göschen island.**—Approaching Edye passage from the southward, the oval-shaped hill near the western extreme of Göschen island is conspicuous. And at 2 miles northward of that hill lies another, with a flat summit, 170 feet high. At 3 miles southward of the latter, the western shore of Göschen island terminates in high white cliffs.

The south-western side of Göschen island has several rocks awash, and sunken rocks extending off it in a westerly direction to the distance of one mile.

**Bass rock**, 30 feet high, situated close to the shore of Göschen island under Oval hill, is small, and bare.

**A rocky ledge**, with depths of 4 to 8 fathoms upon it, extends westward nearly 4 miles, from the south-west side of Göschen island.

**Clearing mark.**—The conspicuous white cliffs on the south side of Stephens island should not be brought to bear westward of North when approaching the western shore of Göschen island.

**Seal rocks** are a cluster of bare rocks of small extent, 10 feet above high water. The centre of this cluster lies W.N.W., distant 6 miles from the summit of Oval hill, and S.S.W.  $\frac{1}{4}$  W., distant 4 miles from cape Ibbetson (south-west entrance point of Edye passage).

There are depths of 12 to 31 fathoms at 2 cables from the Seal rocks.

**Warrior rocks** consist of two bare rocks, 30 feet above high water, and lie E. by S., and W. by N., distant 8 cables from each other. The eastern rock lies N.W.  $\frac{1}{2}$  W., distant  $3\frac{3}{4}$  miles from the centre of the Seal rock cluster.

**Deep patch**, situated at the western entrance of Edye passage, is stated to have 19 fathoms upon it. There is, however, probably less water on this patch, as kelp was observed growing upon it in August.

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\* See Admiralty plan :—Brown and Edye passages, No. 2453 ; scale,  $m = 1$  inch.

The patch is of small extent, and lies N.N.E., distant one mile from cape Ibbetson, and S.W. by W., distant  $2\frac{1}{4}$  miles from the south extreme of Arthur island.

**Clearing mark.**—The south extreme of Arthur island (View point) seen in line with the south-east extreme of that island bearing E. by N.  $\frac{3}{4}$  N., will lead northward of Deep patch.

**Truscott patch**, with 16 feet water upon it, lies E.N.E. distant  $1\frac{3}{4}$  miles from cape Ibbetson, and 6 cables from the nearest shore of Henry island.

**Foul ground** extends off the south-eastern side of Arthur island to the distance of 3 cables.

**Soundings.**—The general depths in Edye passage vary from 23 fathoms to no bottom at 40 fathoms.

**Tides.**—The flood approaches from the westward, and both streams, set fairly through Edye passage, with an average rate of 2 knots an hour.

**Directions.**—Approaching Edye passage from the south-westward, the eastern portion of the high white cliffs on the south side of Stephen island should not be brought to bear westward of North until Oval hill, on Göschén island is seen in line with Seal rocks bearing S.E. by E.  $\frac{3}{4}$  E. Thence a N.E.  $\frac{1}{2}$  N. course may be steered for the mouth of Edye passage, taking care not to shut in Oval hill with cape Ibbetson until the south and south-east points of Arthur island are seen in line. The latter mark may then be steered for, bearing E. by N.  $\frac{3}{4}$  N., until Seal rocks are seen in line with cape Ibbetson bearing S.S.W., when a more easterly course may be steered to pass half a mile southward of the south extreme of Arthur island. When the entrance points of Refuge bay are seen in line, that mark may be steered for, bearing N.E. by N., taking care to avoid the small patch which uncovers at low water 3 cables off the south point of Useless bay. Pass 2 to 3 cables westward of the south entrance point of Refuge bay (Pearce point), and if not desirous of anchoring in that bay, a N.W. by N. course should be steered towards Rachel islands; passing midway between that group and Gull rocks, thence steer as requisite for the destination.

**REFUGE BAY**,\* situated at the north-west extreme of Porcher island, at the north entrance of Edye passage, is an excellent stopping-place during south-easterly winds, or if desirous of proceeding to sea from Chatham sound by the Edye passage, the state of the weather in Hecate strait can be ascertained. This bay is 7 cables wide between

\* See Admiralty plan:—Refuge bay on sheet No. 2453; scale,  $m = 4$  inches.

its entrance points, and takes a south-easterly direction for about a mile, terminating in a sand-flat which extends nearly 5 cables from its head.

The depths in the middle of the bay are from 14 to 23 fathoms, sand, shoaling gradually towards either shore.

**Anchorage** will be found in 12 to 14 fathoms, sand and mud, near the middle of the bay, about 2 cables from the north and south shores, with the north entrance point (Table point) bearing N.N.W., and Pearce point bearing W. by S.  $\frac{1}{2}$  S.

**Tides.**—It is high water, full and change, in Refuge bay at 1h. 30m.; springs rise 17 to 22; neaps 14 to 17 feet.

**BROWN PASSAGE** between Tree nobislands and South Dundas islands, is about 5 miles long in an E. by N. and W. by S. direction, and 5 miles wide.

Nearly in mid-channel, however, lies a cluster of rocks, awash at high water, which divides Brown passage into two channels.

**Butterworth rocks** are a dangerous cluster of rocks, the southernmost is 10 feet above high water, with several patches which uncover at low water extending from it in a north-westerly direction to the distance of three-quarters of a mile. This rock lies S.S.W.  $\frac{1}{4}$  W., distant  $3\frac{1}{2}$  miles from the south-western island of the Tree nob group (Bare island) with that island in line with some wooded islands forming the north-west cluster of Tree nob group (Osborne islands).

There is deep water between Butterworth rocks and Tree nob islands.

**Stenhouse shoal**, a dangerous patch with 7 feet water upon it, is reported to be  $1\frac{1}{4}$  miles in extent. This shoal lies at the western entrance of Brown passage, S.W.  $\frac{3}{4}$  W., distant  $6\frac{1}{2}$  miles from the south extreme of South Dundas island (Cape islet), W. by S.,  $5\frac{1}{2}$  miles from the Hammer rocks, and W. by N., 5 miles from the outer Osborne island.

**North breaker**, over which the sea usually breaks, is the outer known danger extending north-west from the Tree nob group, and lies W.N.W. distant one mile from the outer Osborne island.

**Hammer rock** is a dangerous rock, awash at high water, with depths of 12 and 32 fathoms close to; there are several patches which uncover, extending from Hammer rock in a W.N.W. direction to the distance of three-quarters of a mile. This rock lies nearly in mid-channel, N. by E. distant  $2\frac{1}{2}$  miles from the outer Osborne island, and S. by W. distant  $2\frac{1}{2}$  miles from Cape islet.

**Simpson rock** lies on the north side of Brown passage S. by W. distant three-quarters of a mile from Cape islet; this rock is 6 feet above high water, with rocks awash extending half a mile westward, and a depth of 17 fathoms at 4 cables southward of it; there is a patch which uncovers 3 feet at low water, at 3 cables S.E. of Simpson rock.

**Beaver rock**.—This danger has 12 feet water upon it, and lies S.S.E. distant  $1\frac{1}{4}$  miles from the S.E. extreme of South Dundas island (Deans point). Several patches of rock lie between Beaver rock and the shore of South Dundas island. There are depths of 13 and 17 fathoms at 4 cables southward of Beaver rock.

**Soundings**.—The water in Brown passage is deep, being over 39 fathoms. Depths of 20 fathoms and under extend from one mile to  $1\frac{1}{2}$  miles off the south shore of Dundas island.

**Tides**.—In Brown passage the tides set fairly through at an average rate of 2 knots an hour.

The flood stream approaches from the westward, and off the western entrance of this passage the tides are strong and complicated.

**Directions**.—Brown passage is not recommended to a stranger, but should circumstances compel him to make use of it, the eastern peak of the four-peak range on South Dundas islands should be steered for, bearing N.E. by N., until the eastern and highest Lucy island bears E.N.E., which will lead through Brown passage south of Hammer rock, or bearing E.  $\frac{3}{4}$  N. will lead through, northward of this rock.

**QLAWDZEET ANCHORAGE\*** lies on the north-west side of Stephens island, and it was into this bay Vancouver was conducted by the officer of the *Butterworth* from his dangerous position amidst the Tree nob group.

Qlawdzeet is exposed to the N.W., is three-quarters of a mile wide at its entrance, and one mile deep in a southerly direction.

**Entrance reef**, awash at high water, lies 2 cables N.W. of the eastern entrance point of Qlawdzeet bay.

**Directions**.—The mouth of Qlawdzeet bay will be made if the north extreme of Tagwell island is kept in line astern with the eastern island of the Lucy group, bearing N.N.E.  $\frac{1}{2}$  E.

Keep mid channel when entering, and anchor 3 cables within the bay and  $1\frac{1}{2}$  cables off the south shore, in 12 to 14 fathoms, mud bottom, with

\* See Admiralty plan:—Qlawdzeet anchorage, on sheet No. 2453; scale,  $m = 4.0$  inches.



the eastern entrance point of the bay bearing N.E.  $\frac{1}{2}$  N., distant 4 cables, and the western entrance point bearing W. by N., distant 6 cables.

**Tides.**—It is high water, full and change, in Qlawdzeet anchorage at 1 h. 30 m.; springs rise 17 to 22, neaps 14 to 17 feet.

**Bay islands**, on the south side of South Dundas island, are reported to afford anchorage off their north-west side. The "*Butterworth*," however, "on coming out struck upon a rock which seemed to be a small pinnacle by itself as no soundings were gained near it." (Vancouver, Vol. II., p. 325.)

The examination of this locality has shown the existence of many sunken rocks, the anchorage under Bay islands should therefore not be attempted.

**DUNDAS ISLANDS** on the western side of Chatham sound, were so named by Vancouver. These islands are three in number, the northernmost being the largest and highest. A number of smaller islands (Moffat islands) lie close to the eastern shores of South and Middle Dundas islands. The western shores of the group have not been thoroughly examined, but they are much broken into bays and inlets, with several small off lying islets.

**South Dundas island** is about 3 miles long, in a N.W. and S.E. direction, and 5 miles broad. The shores are comparatively low, wooded, and broken into bays on the south and western sides. Near the middle of this island a mountain range rises to the height of 1,400 feet, with four conspicuous peaks which lie in a N.E. and S.W. direction. The eastern and highest peak of this range is 1,400 feet high, the western and lowest one 1,100 feet high.

**Middle Dundas island** lies about 2 miles to the north-westward of South Dundas island, the passage between is obstructed by numerous low wooded islets, rocks, and sunken dangers. This island is nearly 5 miles long in a N.W. and S.E. direction, with a greatest breadth of 5 miles. In general it is low and wooded, with numerous creeks and bays on its shores. Near the southern end of the island the land suddenly rises in an oval-shaped hill (Coast mound) 750 feet high, which is a useful land mark.

**Connel islands** is the name of a group of small wooded islands which lie off the western side of Middle Dundas island. The outer or south-western island of the group lies off the entrance of the passage between South and Middle Dundas islands, about 2 miles from the western shores of the latter, and 7 miles N.W. from Osborne islands.

**North Dundas island** is about 12 miles long, in a north and south direction, and about 7 miles broad near its north end. This island, the highest and largest of the group, culminates in a mountain with a thumb-shaped summit, 2,500 feet high, about 4 miles from the south end of the island. Near the north extreme of the island there is a hill 700 feet high, with a flat top, and a knob near its north end (Table hill), a most conspicuous and useful mark. The eastern shore of North Dundas island is but little broken; bold, with a range of coast hills about 300 feet high, rising immediately above it. On the northern side, nearly midway between Whitley point and White islets there is a deep bay, useless as an anchorage. At the mouth of this bay lies a group of small wooded islets (Gnarled islands). Off the north-west extreme of the island, close to the shore, are two conspicuous rocks (White rocks).

The western shore of North Dundas island has not been examined in detail. Several islands were, however, seen lying off that shore to the distance of 2 miles.

**ZAYAS ISLAND** is the largest of the islands which lie off the western shore of North Dundas island. The extent of this island has not been ascertained, but it appeared to be about 4 miles long, in a north and south direction, and about two miles broad. The island is wooded, about 250 feet high. A ledge of rocks, which uncover at low water, was observed to extend nearly a mile from the north-west extreme of Zayas island. From the west side of the island, rocks are said to extend 3 miles.

**CHANNEL ISLANDS** are a group of wooded islands, about 100 feet high, extending across the channel between Middle and North Dundas islands. This group renders that channel useless for any but the smallest class of sailing vessel. The passage, however, is frequently used by the Hydah Indians, in their large canoes, when proceeding from Queen Charlotte island to port Simpson.

**Moffatt islands** consist of six principal wooded islands and several lesser ones, the highest being about 250 feet in height. This group, which lies close to the eastern shore of the Dundas islands, extends over a distance of 6 miles in a N.W. and S.E. direction. When abreast, these islands show out well, being clothed with a peculiar deep green pine tree.

**DUICIE ISLAND** is a small wooded islet, 350 feet high, lying one mile N.W. of the Moffatt group. Two conspicuous white rocks, 30 feet high, lie 3 cables westward of Ducie island.

**Whitesand islet** is a small sandy islet, about 10 feet above high water, lying N.E. by E., distant 6 cables from Ducie island. A ledge of

rocks, which uncover, extends N.W. and S.E. of Whitesand islet, to the distance of 4 cables.

**Hammond rock**, of small extent, with 3 fathoms water over it, lies E.N.E., distant 9 cables from the south-eastern extreme of the S.E. Moffat island, and E.  $\frac{3}{4}$  N., distant  $4\frac{1}{4}$  miles from Coast mound. This rock has 34 fathoms close northward of it.

**Coghlan rock**, with 3 feet water, and 6 and 7 fathoms close around, lies 2 miles N.W. of Hammond rock, and N.E. by E., distant  $3\frac{1}{2}$  miles from the summit of Coast mound. There are depths of 43 and 46 fathoms, mud bottom, at one mile northward of this rock.

**Brodie rock** lies N.W. distant  $3\frac{3}{4}$  miles from Coghlan rock. This dangerous pinnacle rock has only 3 feet water over it at low water, with depths of 26 and 33 fathoms at a distance of 100 feet.

The Rachel group of islands, kept open northward of the Lucy group, bearing S.E.  $\frac{1}{2}$  S. will lead northward of the above-mentioned dangers; but during a fog, or in thick weather, the western shore of Chatham sound must not be approached under the depth of 40 fathoms.

#### NORTHERN PORTION.

**Pointers rocks**, are a dangerous cluster of bare rocks, 3 feet above high water, about 2 cables in extent in a north and south direction. The southernmost and highest rock lies N.N.W., distant 3 miles from the north extreme of Finlayson island; and W.S.W. distant  $2\frac{3}{4}$  miles from the north extreme of Birnie island. There are depths of 40 fathoms, no bottom, at half a cable westward; and 12 fathoms, rocky bottom, at a cable eastward of Pointers rocks.

**Connis rocks** consist of one large and several small rocks, nearly in the middle of Chatham sound, abreast port Simpson. The southernmost and highest rock, 15 feet above high water, is bare, and from it rocks extend 2 cables in a northerly direction. The summit of this rock lies W.S.W. distant  $5\frac{1}{2}$  miles from the north extreme of Finlayson island; and S.W. by S. distant  $3\frac{3}{4}$  miles from Pointers rocks.

There are depths of 81 fathoms, 91 fathoms, and 92 fathoms, mud bottom, at the distance of one mile, S.E., S.W., and N.E. of these rocks respectively.

Vancouver remarks:—"These in the daytime and clear weather are easily avoided, as there are always some of them above the surface of the water; but in dark nights, or foggy weather, they must render the navigation of the sound very dangerous."

**Green islet**, situated on the western shore of Chatham sound, about  $1\frac{1}{2}$  miles from North Dundas island, is covered with long grass during the summer. It is small, 40 feet above high water, and has a small bare rock lying close northward, and another close southward.

The middle and largest islet lies S.W. by W. distant 3 miles from the Connis rocks.

**Grey islet** is a small bare rock, of a grayish colour, 30 feet above high water, and lies North, 9 cables from Green islet.

**A sunken rock**, with 6 feet water upon it, lies W.N.W. distant one mile from Grey islet.

There are depths of 19 and 27 fathoms at a cable from this rock.

**A sunken rock**, with 4 feet water upon it, lies South distant 3 cables from Grey islet.

**MAIN PASSAGE**, situated between Pointers and Connis rocks, is  $3\frac{1}{2}$  miles wide, with depths of 128 fathoms, at one mile south-west of Pointers, and 92 fathoms, at one mile north-east of Connis rocks.

Both Connis and Pointers rocks may be approached to the distance of 5 cables.

**ORIFLAMME PASSAGE** passes westward of Connis rocks, between that cluster and Green and Grey islets. It is 3 miles wide, with depths of 23 fathoms at 2 cables eastward of Green islet; and 65 and 70 fathoms, mud bottom, at 7 cables southward of Connis rocks.

The passage between Dundas island and the Green and Grey islets, is nearly  $1\frac{1}{2}$  miles wide. The tides in this passage are strong; and the channel is not recommended to a stranger.

**GNARLED ISLANDS** are a group of wooded islands, about one mile in extent in an east and west direction, lying off the north-west side of the North Dundas island. The group is from 150 to 250 feet in height; and the eastern islet lies W.  $\frac{1}{2}$  N. distant  $2\frac{1}{4}$  miles from the N.E. extreme of the Dundas group.

The channel between Dundas and Gnarled islands is obstructed by ledges which uncover, and sunken rocks.

**White rocks** are two bare rocks, about 30 feet high, lying half a mile from the north-west extreme of North Dundas island.

#### DIXON ENTRANCE.

**DIXON ENTRANCE** is the name given to the channel passing northward of Dundas islands, and between Prince of Wales and Queen Charlotte islands. Several sunken dangers, of doubtful position, are reported to

lie in the western part of this passage, on or near a line joining the north end of the Dundas group and the south end of the Prince of Wales group. But that portion of Dixon entrance which passes northward of Dundas islands is comparatively free from danger.

**CAPE FOX** lies on the north shore of Dixon entrance, and was so named by Vancouver.

This cape is distant about 8 miles from the Gnarled island group, and terminates in remarkable high, white cliffs; with a conspicuous saddle-shaped mountain 1,800 feet high, immediately over it.

**LORD ISLANDS** are a group of about a mile in extent, lying 3 miles south-east of cape Fox. This group is wooded, about 250 feet high, and the south-west island is distant 5 miles from the outer or north-western island of the Gnarled island group.

**A ledge** which uncovers 3 feet at low water, lies S.W. by S. distant 8 cables from the south-west island of the Lord group.

**Soundings.**—At 8 cables northward of the Gnarled island group, there is a depth of 155 fathoms, rocky bottom; and at 8 cables southward of the Lord island group, a depth of 73 fathoms, gravel bottom, was obtained. The depths in mid-channel are 103 and 110 fathoms, gravel bottom; deepening to 170 and 214 fathoms as Chatham sound is approached.

**Nakat inlet** is an unexamined arm of the sea which lies between cape Fox and Tongas island.

**TONGAS ISLAND** lies about 3 miles eastward of cape Fox, and about 16 miles north-west of port Simpson. This island was chosen in 1867 as a military post by the United States, after purchasing Alaska. Fort Tongas is small, and was garrisoned by one company (1868). The settlement is dreary. The almost constant rain and soft soil produces mud of a most tenacious nature.

**Anchorage.**—The approaches to Tongas settlement are intricate and require local knowledge; the anchorage abreast the fort is bad, with deep water and limited accommodation even for a vessel of moderate length. H.M.S. *Sparrowhawk* experienced great difficulty in tugging abreast fort Tongas.

The approach from the south-east, is about 3 miles long, and passing between numerous islets, is in places barely a cable wide. The depths in this passage are said to be from 5 to 16 fathoms.

The principal approach to Tongas is from the westward, and is about 5 cables wide. There are said to be depths of 5 and 8 fathoms within this passage.

The following extract is from a report to the U.S. Government upon Tongas:—"The harbour, in and about it, needs a careful survey, being "in rather a bad situation, surrounded by rocks, reefs, and shoals, on "the outside and inside."

**Tlechopciky harbour** (or Clement's city), is one of the south-eastern approaches to Tongas from Chatham sound. This passage is intricate and constricted.

**Boston islands** lie off Wales island, at the south-eastern approach to Tongas.

This group is about one mile in extent, in an east and west direction. The larger islands are wooded, about 150 feet high, the smaller ones are bare, 50 feet high. The western island is 450 feet high, round, wooded, and conspicuous.

**A ledge**, which uncovers at low water, lies E. by S. distant one mile from the easternmost of the Boston islands, and one mile from the nearest shore of Wales island.

**WALES ISLAND**, situated on the north-west side of the entrance to Portland inlet, is about 7 miles long in an east and west direction, its north-eastern side being about 4 miles long. The north-eastern shore is bold, with some conspicuous cliffs of red-brown colour, nearly midway between the north and south extremes of the island. A small islet lies close to the shore at the north extreme. On the south side, about one mile westward of Wales point, the south-east extreme of Wales island, a deep bay faces south-eastward, and within it are some patches which uncover and rocks awash. A wooded islet, about 5 cables long, in a N.W. and S.E. direction, lies at the mouth of this bay S.W.  $\frac{1}{2}$  W., distant  $1\frac{1}{2}$  miles from Wales point. A smaller islet lies one mile south-westward of the larger one.

Entry peak lies about half a mile north-west of Wales point; this mountain is 1,400 feet high, of triangular shape, with a sharp conspicuous summit. A mountain, with a flat summit, 1,100 feet high, lies near the middle of Wales island.

**Cod bank**, with depths of 33 and 47 fathoms, mud and shells, lies between Pointers rocks and Parkin island, extending from the latter, within the 50 fathom line, to the distance of  $1\frac{1}{2}$  miles.

There is a depth of 109 fathoms, mud bottom, at 5 cables south, and 99 fathoms, rock, at 5 cables north of Cod bank.

Cod fish of large size are caught upon this bank.

**TIDES.**—The tides in Dixon entrance and Brown passage, especially in the western parts of those channels, are variable and complicated. The

flood stream approaching from the southward up Heete strait is met by the stream passing westward and northward of Queen Charlotte islands, at about 15 miles eastward of Rose point, or about midway between the north-east extreme of Queen Charlotte islands and the Tree Nob group. Northward of that position this meeting of the streams produces tidal irregularities, and at spring tides, or during bad weather, the turmoil caused by the meeting of the streams is so great as to convey an appearance of broken water to that portion of the ocean which lies between Queen Charlotte islands and Brown passage and Dixon entrance.

In Chatham sound the tides set fairly through.

**Winds.**—The prevailing winds during the summer on the coast northward of Vancouver island are from the north-west, preceded during the earlier summer months by south-westerly winds.

During the winter months S.E. and S.W. winds prevail.

Gales from the S.E. prevail at all seasons, and are more frequent and severe than those experienced on the coast of Vancouver island. The summer gales are of shorter duration than those of winter and seldom last more than 48 hours. At the fall of the year, gales lasting for 8 days, from the S.E. have been experienced.

The strength of the summer winds depends greatly upon local circumstances. Down the channels, which lie in a N.W. and S.E. direction, with high land on both shores, they frequently blow with great strength. The wind usually begins at sunrise, increases in strength throughout the day until about 3 p.m., and then gradually declines towards sunset. The nights as a rule are calm during the summer months. But, if the wind prevail but slightly from the N.W. during the night, it will probably blow hard from that quarter on the following day.

The barometer stands at about 30.10 during the prevalence of N.W. winds. Gales from the south-east are usually preceded by a falling barometer, but not invariably. A sensation of dampness in the atmosphere is the usual precursor, and the wet and dry bulbs, though as a rule not differing greatly upon this coast, more closely register the same.

If during the summer the barometer fall a tenth of an inch, especially if it has been registering higher than 30.20, a gale from the south-east is probable.

These gales usually begin at E.S.E., veering to the southward with a falling barometer, and the wind remains at S.E. and S.S.E. for a long or short period according to the season of the year. With a rising barometer the wind shifts to the S.W. with violent squalls, and then hauling more westerly blows itself out. A strong S.E. gale was experienced, of short duration, during the summer, with the barometer previously registering 30.17 and falling to 30.12.

**Fogs** are prevalent, especially during the summer months. The north-west winds which prevail during that season condense the vapour which arises from the comparatively warm water which surrounds Queen Charlotte island and the coast of Alaska. During the prevalence of north-west winds this vapour is dispersed, but during calms or with light winds, and especially with south-westerly winds succeeding north-west winds, it approaches quickly from seaward in the form of dense fog or drizzling mist and rain.

At times fogs will be found at the mouths of the sounds during the forenoon, dispersing near noon by the heat of the sun, the afternoons being accompanied by fine clear weather.

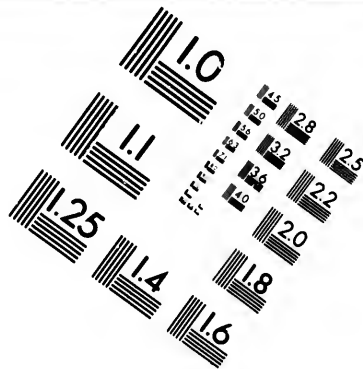
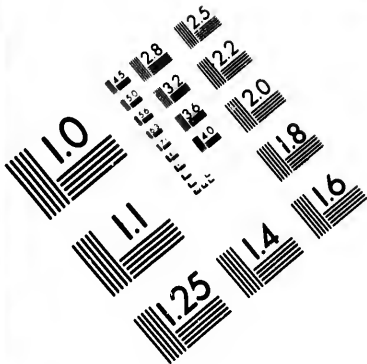
**Climate.**—The climate of Queen Charlotte islands and the off-lying islands of the coast of British Columbia is influenced by the warm body of water which washes their shores. The climate is milder, the winter being less severe on the islands than within the inlets. The vapour arising from this body of warm water is condensed upon the high mountains which form the shores of the main land, and falls in the drizzling, almost constant, rain, so prevalent in these waters.

During the winter, within the inlets, ice of 8 and 12 inches thickness is formed, and occasionally extends as far as 25 miles from the heads of the inlets.

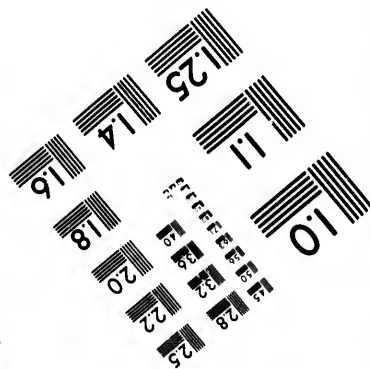
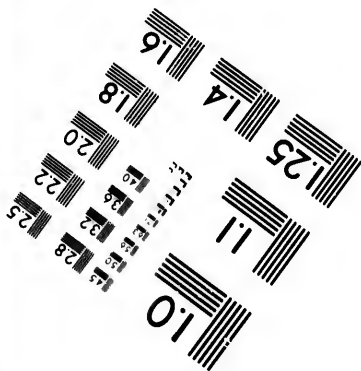
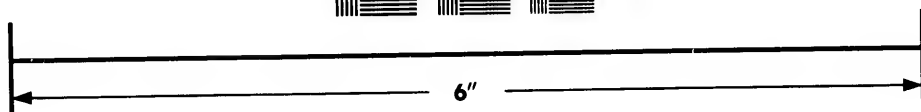
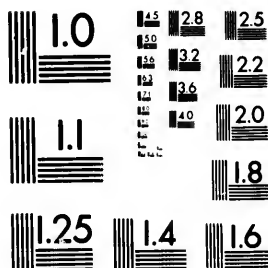
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## CHAPTER IV.

## INNER WATERS.—LAREDO SOUND TO OGDEN CHANNEL.

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 VARIATION IN 1883.

Laredo sound, 25° 40' E.      |      Ogden channel, 26° 10' E.

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**LAREDO SOUND\*** situated between Price and Aristazable islands, connects Hecate strait with Laredo channel. This sound is nearly 20 miles long in a general N.N.W. and S.S.E. direction; and from 3 to 14 miles wide.

**Landmarks.**—Kititstu hill on the north-eastern shore of the sound, is of triangular shape, with a well defined summit 760 feet high. Over the north shore of the sound rise three remarkable mountains, the summits of the two northern having sharp pinnacles (north and south Needle peaks), 2,600 and 2,800 feet in height. The summit of the southern and lowest of the three peaks is of conical shape, 2,400 feet high. At 4 miles from the eastern extreme of Aristazable island; two conspicuous hills, forming a saddle, rise to the height of 640 feet.

**Coast.**—The eastern shore of Laredo sound is low, wooded, and much broken into bays and creeks. It is fringed by numerous islets, rocks awash, and sunken rocks, to the distance of 2 miles from the west coast of Price island. Outer island, which lies off Day point, when seen from Laredo sound, appears round and well defined.

At the western entrance of the sound a group of islands and islets extend southward from Aristazable island.

**Nab rock** is a dangerous sunken rock, over which the sea only breaks at long intervals; it lies S.E. by E. distant  $3\frac{8}{10}$  miles from the summit of Entrance island.

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\* See Admiralty chart, cape Caution to port Simpson, southern portion, No. 1,923 B.

The ground is foul to the distance of one mile south-east of the rock, and several ledges uncover at low water between Nab rock and Entrance island.

**Don point**, situated on the western shore, N. by E., distant 4 miles from the summit of Entrance island, is a peninsula 150 feet high, and when first seen, makes as an island.

Close northward of Don point lies a small cove, which affords shelter to boats.

**Double island** lies on the eastern shore of the sound, N.W.  $\frac{1}{2}$  N., distant 17 miles from the summit of Outer island.

This island is wooded, about 100 feet high, and divided near the centre by a cleft which causes it to appear as two islands when seen from the southward, and northward.

**Low point**, wooded and flat, lies N.N.W., distant  $2\frac{1}{2}$  miles from the summit of Double island.

**Low rock**, which uncovers at low water, lies 4 cables N.N.W. from Low point.

**Schooner point** is the turning point into Laredo channel, and lies N. by W., distant 7 miles from Don point. The coast between Schooner and Don points is bold and rocky.

**Schooner ledge** which uncovers at low water, lies 3 cables northward of Schooner point.

**South Bay islands**, a group of small extent, lie at the head of Laredo sound.

The larger islands are wooded, 250 feet high. The centre island of the group lies N.  $\frac{1}{2}$  W., distant  $2\frac{1}{2}$  miles from Low point; and E.N.E., distant 3 miles from Schooner point.

**North Bay islands** consist of three principal wooded islets, of small extent, 250 feet high. The centre island of the group lies N.W., distant  $1\frac{1}{2}$  miles from the centre island of the South Bay group.

**Steep point**, high and bold, forms the north-east entrance point of Laredo channel. It lies N. by E., distant 2 miles from Schooner point.

**Soundings.**—At 3 miles W.S.W. of Outer island there is a depth of 10 fathoms, mud. At 9 miles W.  $\frac{1}{2}$  N. from that island, and 4 miles south-east of Nab rock, a depth of 19 fathoms, rock, was obtained. Between those positions the depths are from 42 to 65 fathoms, sand. This bank of comparatively shoal water stretching across the mouth of Laredo sound, should serve to distinguish that sound, in thick or foggy weather, from Milbank sound, there being depths of over 100 fathoms at the mouth of the latter.

**Directions.**— Small sailing coasting vessels, to avoid the light winds and calms which frequently prevail in the inner channels, make use of Laredo sound and the channels leading northward from it, as the wind seldom fails them in those channels.

In clear weather, if Outer island be not brought to bear southward of East, a vessel will pass south of Nab rock. Kit-it-stu hill steered for on a N.  $\frac{1}{2}$  E. bearing will lead eastward, and Schooner point bearing N.N.W. leads northward of Nab rock.

Pass one mile off Schooner point, and proceed through Laredo channel as herein-after directed.

**LAREDO CHANNEL**, between Princess Royal and Aristazable islands, is about 20 miles long in a general N.W. by W. and S.E. by E. direction, and from 2 to 5 miles wide.

At 6 miles within the eastern entrance Laredo channel is obstructed by a group of islands and islets, which contracts the navigable channel to barely 7 cables wide.

Westward of that group, the channel again widens out, and attains the width of 5 miles at its western end.

**Fury point** lies on the south shore, and terminates in black, smooth, rocks. A small bay, with a sandy beach at its head, and an islet at its mouth, lies close eastward of Fury point. The point lies N.W. by W.  $\frac{1}{2}$  W., distant 4 miles from Schooner point.

**Beaver ledge** uncovers at low water, and lies 5 cables from the south shore, at  $1\frac{2}{10}$  miles westward of Schooner point.

There is deep water close northward of this ledge.

**Islet rock** lies close southward of a small islet on the north shore, at  $1\frac{1}{2}$  miles westward of Steep point.

**South Channel islands** consist of five principal wooded islands, 150 feet high, and about one mile in extent in an east and west direction. This group lies nearly in mid channel, 6 miles from Schooner point.

**North Channel islands** consist of two principal wooded islands, of small extent. The eastern island of the group lies N.W. by W., distant  $1\frac{1}{2}$  miles from the western island of the South Channel group.

**Channel rock** is a dangerous sunken rock, lying nearly in mid-channel, S.E. by E. distant 6 cables from the eastern islet of the South Channel group.

**Bluff point** lies on the south shore N.W. by W.  $\frac{1}{2}$  W., distant  $7\frac{1}{2}$  miles from Fury point. This point is high and bold, with a hill 400 feet high rising immediately over it. On the north shore of Laredo channel, abreast Bluff point, lies an islet at the mouth of a creek.

**Seal rocks** cover at high water, and are of small extent; 5 cables from the south shore, and W.N.W. distant 2 miles from Bluff point. There is deep water at 2 cables northward of Seal rocks.

**Sandspit point**, situated N.W. by W.,  $5\frac{1}{2}$  miles from Bluff point, is white and conspicuous, with a ridge of bare hills, 700 to 900 feet high, immediately over it.

**Sandspit shoal** extends 5 cables northward of Sandspit point.

**Devils point**, the western entrance point of Laredo channel, lies W.N.W. distant 4 miles from Sandspit point. Over this point lies a bare hill with a conspicuous boulder or knob on its summit.

**Spray point**, the north-east entrance point of Laredo channel, is bold, high, and lies E.N.E., distant 5 miles from Devils point. At one mile eastward of Spray point a small islet lies close to the north shore.

**Soundings**.—No bottom could be obtained at 40 fathoms in Laredo channel.

**Tides**.—The flood stream which approaches from Laredo sound, increases in strength as the Channel island group is approached, attaining the velocity of 6 knots an hour at springs in the channel north of that group (Surge narrows).

In the wider portions of Laredo channel both streams attain the velocity of 3 knots an hour at springs.

Midway between Devils and Spray points, the flood stream by Laredo channel is met by the stream passing round the north-west end of Aristazable island, causing at springs dangerous tidal races in that locality.

The ebb stream having divided in mid channel off Devils point, one portion proceeds round the north-west end of Aristazable island. The other sets fairly down Laredo channel, and attains the velocity of 6 knots an hour at springs in Surge narrows. From Surge narrows the stream sets directly towards Fury point, and thence sweeps along the southern shore of the channel, passing across Laredo sound to Low point, whence it is deflected and sets fairly to the southward.

**Directions**.—Having rounded Schooner point at the distance of one mile, a N.W. by W.  $\frac{3}{4}$  W. course for 6 miles should lead into Surge narrows, taking care, especially if the ebb stream be running, to avoid Channel rock.

Westward of Surge narrows, a general course of N.W. by W.  $\frac{1}{2}$  W. will lead through Laredo channel to the mouth of Estevan sound.

**CAMPANIA SOUND** between Princess Royal and Campania islands, is 5 miles long in a general N.N.E. and S.S.W. direction, and 3 miles wide.

On the eastern shore of the sound, a conspicuous ridge of hills, with rounded summits, rise to the height of 900 feet, and the coast is slightly broken into a few useless bays and creeks.

On the western shore, the coast of Campania island is indented with a few rocky bays. At the south-west entrance of the sound, 3 cables from the south-east extreme of Campania island lies a small wooded islet, 100 feet high (Eclipse island).

The western shore of the sound, for one mile northward of Eclipse island, has ledges which uncover to the distance of 5 cables.

Northward of that position, the western shore has no known danger beyond 2 cables from it.

The eastern shore of the sound has ledges extending from it to the distance of 5 cables.

**South Surf islands**, situated at the south-east entrance of Campania sound, consists of three wooded islands 250 feet high, with several small, rocky islets close to.

**North Surf islands**, 250 feet high, lying three-quarters of a mile W. by N.  $\frac{1}{2}$  N. from South Surf islands consist of three wooded islands one mile in extent N.N.W. and S.S.E.

**Soundings.**—No bottom at 40 fathoms could be obtained in Campania sound.

**SQUALLY CHANNEL**, situated between Gil and Campania islands, is 10 miles long in an E.S.E. and W.N.W. direction, and from  $2\frac{1}{2}$  to  $4\frac{1}{2}$  miles wide.

**GIL ISLAND**\* which forms the north side of Squally channel, is 15 miles long in a N.W. by N. and S.E. by S. direction, and 6 miles broad. Turtle point, the north extreme of the island, is a peninsula, with small bays east and west of it. The north shore has a few curves along it, scarcely deep enough to be called bays.

Gil mount is situated near the north-east end of the island, and attains the elevation of 3,000 feet, the summit being well defined, and always clad with snow on the north side. From Gil mount the land slopes gradually towards the north extreme of the island.

A ridge of mountains, 1,500 to 2,000 feet high, extend in a southerly direction from Gil mount, curving gradually to the south-eastward, and terminating at about 3 miles from the south end of the island.

The south-east extreme of Gil island is wooded, flat, and low.

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\* Isle de Gil of the early Spanish charts.



**Channel reef** uncovers at low water, and extends 5 cables from the south extreme of Gil island (Ledge point), and fringes the shore of that island, at the same distance, for  $1\frac{1}{2}$  miles north-westward of Ledge point.

**Windy islets** are a group of three islets, the outer of which lies 5 cables from the south-west shore of Gil island, at 2 miles westward of Ledge point.

**Windy rock** uncovers at low water, and lies E.S.E. distant 5 cables from the outer or south Windy islet.

There is a depth of 20 fathoms at a cable south of the rock.

**Black rock**, situated on the north shore of Squally channel at 2 cables from the south-west extreme of Gil island (Blackrock point) the turning point into Lewis passage, covers at high water, is small, and nearly steep-to.

The south side of Squally channel has no known danger beyond a cable from the shore.

**Soundings.**—The depths in Squally channel are from 15 fathoms, to no bottom at 40 fathoms.

**Weather.**—Violent squalls will often be experienced in Squally channel, descending from the high land of Campania island, when calms or light winds and smooth water will be found in Whale channel.

**LEWIS PASSAGE**, between Gil and Fin islands, takes a northerly direction for 4 miles, thence a north-west direction for 4 miles, into Wright sound, with an average width of  $1\frac{1}{4}$  miles.

The eastern shore of Lewis passage has no known danger beyond half a cable from the shore.

**FIN ISLAND** lies 2 miles westward of Gil island, and is 4 miles long in a north and south direction, with an average breadth of  $1\frac{1}{2}$  miles. Plover point, the north extreme of Fin island, has a deep bay close northward of it, with several islets lying at the mouth of the bay. The bay dries throughout at low water. Four bare rocky islets fringe the north shore of Fin island, at the distance of a cable.

**Fin rock** is awash at high water, and lies on the western shore of the channel, 2 cables from the south extreme of Fin island.

**CRIDGE PASSAGE**, between Fin and Farrant islands, is 3 miles long in an E.N.E. and W.S.W. direction, and one mile wide.

**Soundings.**—There is no bottom at 40 fathoms in mid-channel in Cridge passage.

**FARRANT ISLAND** lies at the south-east entrance of Grenville channel, and is 9 miles long in a W.N.W. and E.S.E. direction,

and from 4 to 6 miles broad. The land on the south side of Farrant island reaches an elevation of 1,700 feet.

**Blossom point**, the south extreme of the island, has a small islet lying close to, with a ledge extending a cable south-west of it.

**Block head**, the eastern extreme of Farrant island, terminates in a high, bold, white cliff. The coast between Block head and Yolk point is broken into several bays; the largest lies close under the latter point, and has two patches of rock which uncover, lying 2 cables from the shore at its mouth.

**Yolk point**, the north-east extreme of the island, lies W. by N.  $\frac{1}{2}$  N. distant  $3\frac{1}{2}$  miles from the north extreme of Gil island, and N.W. 4 miles from Yolk point.

Yolk point is smooth, bare, and rocky; and is nearly steep-to.

**Davenport point**, the north extreme of Farrant island, is a bold projection, and lies W.N.W., distant 3 miles from Yolk point.

**Union Passage** (Matliksintas), between Farrant and Pitt islands, enters Grenville channel about 4 miles westward of Yolk point. This passage has not been explored.

**WHALE CHANNEL**, situated between Princess Royal and Gil islands, is 12 miles long in a general N.N.W.  $\frac{1}{2}$  W. and S.S.E.  $\frac{1}{2}$  E., direction, and from 2 to 3 miles wide. There is no known danger in this channel beyond 2 cables from the shore.

**Soundings.**—There is no bottom at 40 fathoms in Whale channel.

**Leading point** lies on the eastern shore, 5 miles southward of Holmes bay. (See page 36). Immediately over the point is a conspicuous hill, of triangular shape, 700 feet high.

**River bight** lies between Holmes bay and Leading point, and is a deep indentation, with a large river at its head.

**Maple point** lies on the western shore, abreast of Holmes bay. This point is comparatively low, and wooded, with many maple trees growing.

At one mile south of Maple point lies a sandy bay, with a conspicuous sandy beach at its head.

**Shrub point**, on the western shore, 5 miles southward of Maple point, is comparatively low, flat, and wooded.

**Camp islet** is a small, conspicuous, wooded islet, lying 2 cables from the western shore, at 9 miles southward of Maple point. This small islet is connected with the eastern shore of Gil island at low water.

South of Camp islet there is a comparatively deep bay, one mile wide at its mouth. This bay is occupied at low water by a ledge of rocks which uncovers.

**Molly point** lies on the western shore, one mile south-east of Camp islet, and is the turning point of Whale channel into Campania sound.

**Trouble island** is a small, narrow, low island, lying one cable from the eastern shore, at the south entrance of Whale channel.

**Barnard cove** lies south and east of Trouble island, and affords shelter to boats and small craft. Pass mid-channel between Trouble island and the eastern shore of Whale channel, and anchor in 20 fathoms, mud, in the eastern part of the cove, 2 cables from the eastern shore.

**Passage island** situated at the junction of Whale channel and Campania sound, is 2 miles long in a north and south direction and one mile broad. It is wooded, the tops of the trees being about 250 feet above high water. Off the south-east side of Passage island, a group of islets, rocks, and sunken dangers extend 5 cables in a south-easterly direction.

The passages east and west of Passage island are deep, and 6 cables wide. On the eastern shore of the eastern channel, several rocky islands extend from one to 2 cables from the shore, at the mouth of a bay.

**ESTEVAN SOUND** lies between Estevan and Campania islands, and is about 15 miles long in a general W.N.W. and E.S.E. direction, and from  $2\frac{1}{2}$  to 5 miles wide. At the south-east entrance of the sound there are several islets, rocks, and sunken rocks, nearly in mid-channel. To a stranger, therefore, Estevan sound cannot be recommended.

If, however, circumstances should compel him to use it, a course should be steered to pass three-quarters of a mile northward of South Watcher islet. Thence a general course of W.N.W. cautiously for 15 miles should take a vessel into Nepean sound, keeping nearer the south shore of the channel, to avoid the dangerous ledges which extend to the distance of a mile from the south side of Campania island.

**CAMPANIA ISLAND** is nearly 15 miles long in a W.N.W. and E.S.E. direction, and from one mile to 4 miles broad. At one mile from its eastern extreme the island has an elevation of 1,000 feet, increasing westward, until it culminates in two bare mountains, with dome-shaped summits, 2,000 feet high. These mountains are of granite formation, and furnish an excellent landmark when seen from seaward. From their summits, which lie 4 and 6 miles respectively from the eastern extreme of the island, the land falls to the westward, the western end of Campania island being, comparatively, low and wooded.

The northern shore of the island is bold, with a few rocky bays along it. The north-east extreme terminates in a high, bold, white cliff.

The southern shore is low, wooded, and broken into bays and creeks; fringed by islets, rocks awash at high water, and at low water, to the distance of one mile.

The western shore is bold, and little broken, with a small, white rock, 6 feet above high water, lying 5 cables from it (Marble rock).

**South watcher** is a small wooded islet, 100 feet high, lying nearly in mid channel at the eastern entrance of Estevan sound. The summit of this islet lies S.W.  $\frac{1}{2}$  W. distant  $3\frac{2}{10}$  miles from Eclipse island; and N.E. by E.  $\frac{1}{4}$  E., distant  $3\frac{2}{10}$  miles from Breaker point.

The South watcher has ledges which uncover at low water extending from it north-west and south-east to the distance of 5 cables.

**North watcher** islet is small, wooded, and conspicuous; 60 feet high; and lies W.  $\frac{3}{4}$  N. distant  $1\frac{8}{10}$  miles from South watcher islet.

The North watcher has ledges which uncover, and sunken dangers surrounding it to the distance of 8 cables.

**Blinder rock**, over which the sea breaks occasionally, lies S.W. by W. distant one mile from the summit of South watcher islet; and S.E. distant a little more than a mile from North watcher islet.

**Estevan ledge**, which uncovers at low water, is one cable in extent; and lies West distant 8 cables from the summit of North watcher islet.

**Breaker point**, the eastern extreme of Estevan island, is low and wooded, from this point the coast trends N.W. by N. for about 4 miles, and is broken into bays and creeks, with several islets and rocks lying close to the shore, thence W.N.W. for about 5 miles, at which point lie two conspicuous small islets, a cable from the shore from which the coast trends W.  $\frac{1}{2}$  S. for about 6 miles, with a deep curve to the southward, until terminating at the mouth of Otter passage.

**Don ledge**, which uncovers at low water, extends E.N.E. 6 cables from Breaker point.

**Breaker reef** consist of 3 rocks awash, surrounded by sunken rocks over which the sea nearly always breaks; the outer rock of which lies S.W., distant  $2\frac{1}{2}$  miles from Breaker point, and nearly  $1\frac{1}{2}$  miles from the nearest part of Estevan island.

**Trap rocks**, some of which are awash at high water, extend 8 cables northward of the north-west extreme of Estevan island; and thence front the western end of the island at the distance of 2 to 6 cables.

**Guano rocks** lie on the north shore, and consist of a cluster of 3 white rocks, lying one mile off the south side of Campania island at 6 miles westward of Eclipse island.

The highest rock is 30 feet above high water; and the group is surrounded by rocks awash and sunken rocks to the distance of 5 to 7 cables.

Between Guano rocks and Eclipse island, ledges which uncover at low water extend 5 to 6 cables from the shore.

**Marble rock** lies 5 cables westward of the west extreme of Campania island. This bare rock is 6 feet above high water, small, white, and conspicuous.

Marble rock is nearly steep-to on all sides, and may be approached to half a cable.

**Soundings.**—The depth of 40 fathoms was obtained in Estevan sound, at 2 cables from the dangers fronting the shore of Campania island, depths of 7 and 20 fathoms were found close alongside of the rocks.

**NEPEAN SOUND** lies between Estevan sound and Principe channel, and is about 7 miles long and 4 miles wide.

**Otter channel** leads westward from Nepean sound, and is about  $3\frac{1}{2}$  miles long, and from  $3\frac{1}{2}$  miles at its western, to one mile wide at its eastern end. There is no known danger beyond a cable from the shore in Otter channel.

**Soundings.**—The water in Otter channel is deep, there being no bottom at 40 fathoms at 5 cables from the shore on both sides.

**Steep point**, the north-eastern entrance point of Otter channel, terminates in a high, bold, white cliff.

**OTTER PASSAGE** leads south-westward from Nepean sound, between Estevan and Banks islands. This passage, though nearly  $1\frac{1}{2}$  miles wide, is obstructed on its western shore by a group of islands, islets, and rocks (Block islets), which contract the navigable channel to barely 4 cables wide in places.

This narrow channel is rendered more dangerous by the strong tides within it, the greater portion of the ebb finding its way out of Nepean sound by Otter passage. This stream, which passes through at the rate of more than 6 knots an hour at springs, meeting the ocean swell at the western entrance of Otter passage, produces a most turbulent breaking sea, dangerous to small vessels.

In no case should Otter passage be attempted, except at slack water and with local knowledge.

**PRINCIPE CHANNEL**, between Pitt and Banks islands, is about 42 miles long in a general W.N.W. and E.S.E. direction, and from 2 to 7 miles wide. From its eastern entrance this channel takes a general N.W. by W.  $\frac{1}{2}$  W. direction for 18 miles, W. by N. for 10 miles, and W.  $\frac{1}{2}$  N. for 14 miles to the mouth of Ogden channel.

The south shore of the channel is bold, with mountains from 1,200 to 1,700 feet rising over it.

The north shore is much broken, especially about midway, into bays, in two of which anchorage may be found (ports Stephens and Canaveral).

The mountains on Pitt island, at about 3 miles from the shore, rise to the height of 1,000 to 3,000 feet.

**Deer point** at 4 miles westward of Block islets, is a small peninsula on the south shore, and makes as an islet.

**Gale point** is prominent, bold, and high, and lies 5 miles north-west of Deer point. A remarkable bare mountain, 1,250 feet high, lies close to the shore at 3 miles westward of Gale point. The coast immediately under this mountain is broken into several narrow creeks, with some small rocky islets at their mouths. With the exception of these bays the south shore of Principe channel is unbroken.

**Despair point** at 11 miles westward of Gale point, is bold, and nearly steep-to.

**Headwind point** lies  $5\frac{1}{2}$  miles westward of Despair point, thence the coast is bold and unbroken.

**Deadman islet** is a small wooded islet lying close to the shore off the north-west extreme of Banks island, about 15 miles westward of Headwind point.

End hill is an oval-shaped hill 450 feet high, lying close to the south shore at 2 miles eastward of Deadman islet.

**Wolf point**, the south-eastern entrance point of Principe channel, is high, bold, and conspicuous, with several small islets close-to.

**Brodie rock**, a dangerous sunken rock, lies S.W. by W.  $\frac{1}{2}$  W. distant one mile from Wolf point. Between Brodie rock and the shore the ground is foul to 2 miles westward of Wolf point.

A depth of 66 fathoms was found at 2 cables south of Brodie rock.

**Port Stephens\*** lies on the north shore at about 8 miles within the eastern end of Principe channel.

The harbour at its entrance is 4 cables wide, and extends in a N. by E. direction 6 cables, N.E. 6 cables; and thence in an easterly direction for 8 cables, terminating in two bays, with a large stream at the head of the southern bay.

Guide islet, a small bare islet, lies one mile eastward of the port, with two small islets (the Sisters) lying nearly midway between it and port Stephens.

**Directions.**—Keep mid-way between the entrance points (Bluff and Centre points), and steer N. by E. for 5 cables; thence N.E. for 5 cables, keeping mid channel. Haul gradually to the eastward as the harbour opens out, and anchor in mid channel in about 12 fathoms, with Bluff point shut in with the south shore, the latter distant 2 cables.

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\* See Admiralty plan:—Port Stephens, on sheet No. 2,169; scale,  $m = 3\cdot25$  inches.

**Tides.**—It is high water, full and change, at port Stephens at Oh. 30m.; springs rise 18 feet.

**Bluff point** situated N.W. by W.  $\frac{1}{4}$  W. distant 8 miles from Wolf point forms the western entrance point of port Stephens and terminates in a high white cliff.

**Oar point** lies W.N.W. distant 6 miles from Bluff point, the coast between those points being bold and unbroken. Immediately westward of Oar point, the coast recedes northward, terminating in two narrow arms (Mink trap bay).

**Canoe islet** is a small bare, islet, not unlike a canoe in appearance, when first seen.

It lies off the mouth of Mink Trap bay, at one mile N.W. by W.  $\frac{1}{2}$  W. from Oar point.

**Green top islet**, situated N.W. by W.  $\frac{1}{2}$  W., distant three-quarters of a mile from Canoe islet, is small, with a patch of grass and shrub on its summit.

**MINK TRAP BAY** situated on the north shore, about 8 miles westward of port Stephens, consists of two long narrow creeks, separated by a peninsula; this bay has deep water in it, but is useless as an anchorage for other than small vessels and boats.

At the head of the eastern arm is an Indian village, to which a tribe of the Kit Katlah Indians resort in summer for salmon fishing.

**Anger island**, on the north shore, 9 miles westward of Oar point, is about 4 miles long and 2 miles broad, with shoals extending from its south and east sides 5 to 7 cables. Near its western end the island reaches an elevation of 730 feet.

**Trade and Storm islands** are clusters of islets which extend from 5 cables to  $1\frac{1}{2}$  miles from the south and eastern shores of Anger island.

**Wheeler islet** is a small wooded islet, distant 5 miles from the western extreme of Anger island (Foul point).

**Cliff islets** extend north-east of Wheeler islet to the entrance of Petrel channel. These islets are bare and rocky, with foul ground between them and the shore of McCauley island.

**McCauley island** on the north shore, is 17 miles long, 9 miles broad, and wooded nearly throughout.

This island near its centre rises to the height of 1,160 feet. Almost midway, on its south side, a bare hill with a flat top, 400 feet high, lies close to the shore.

**PORT CANAVERAL\*** lies near the south-east extreme of McCauley island, about 21 miles westward of port Stephens.

**Dixon island** lies on the western side of the port, with several islands and islets lying off its south and eastern sides to the distance of 2 cables.

**Squall point**, the south-east entrance point of port Canaveral, is the termination of the spur from Hat hill, and is bold and conspicuous.

**Red point**, on the north shore, opposite Squall point, has a cliff of red-brown colour over it.

**Alarm rock**, with 8 and 10 fathoms close-to, is a dangerous sunken rock lying nearly in mid-channel at the mouth of port Canaveral, at 2 cables W.N.W. from Squall point, and  $2\frac{1}{2}$  cables from Red point.

**Harbour bank**, with 6 fathoms over it (probably less) lies  $1\frac{1}{2}$  cables eastward of Alarm rock, and midway between Squall and Red points.

**Clown rock** lies on the western shore, and is the outer danger extending south-east of Dixon island.

This rock, which dries 3 feet, lies S.E. by E. distant 3 cables from Tonkin point (the south extreme of Dixon island), with foul ground between it and the shore.

**Stephen rock** is 3 feet above high water, and lies on the western shore at a cable and a half from Dixon island. The outer portion of Stephen rock, which uncovers at low water, lies S.E. distant  $2\frac{1}{2}$  cables from Dimple point (north-east extreme of Dixon island).

**Directions.**—Entering port Canaveral, Dimple point may be steered for when in line with Stephen rock, bearing N.W. by W., until Bush islet (off south-west extreme of Dixon island) is just shut in with Tonkin point W.S.W. The latter mark kept on astern will lead to the anchorage ground; and anchor in 14 to 15 fathoms, sand bottom, at  $1\frac{1}{2}$  cables north-east of the north entrance point (Red point.)

**Tides.**—It is high water, full and change, in port Canaveral at Oh. 30 m.; springs rise 18 feet.

**Anchorage** was obtained by Vancouver, on two occasions, on the north shore, westward of port Canaveral, at 3 cables from the shore, in 34 and 35 fathoms, respectively. The exact positions are not recorded.

**Bush and Dark islets** are small, wooded islets, which lie close to the south shore of McCauley island, off the mouth of port Canaveral, at 2 miles westward of Wheeler islets.

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\* See Admiralty plan :—Port Canaveral, on sheet No. 2,189; scale,  $m = 3.25$  inches.



**Petrel channel** is an unexamined passage between Pitt and McCauley islands; its southern entrance is about 3 miles wide, thence the channel runs north-west for nearly 8 miles, when it divides, one passage running northward, the other southward of Lofty island, and again joining at 2 miles eastward of Ogden channel.

**Hankin ledges** consist of rocks awash and sunken dangers, which extend nearly one mile off Hankin point (south-west extreme of McCauley island).

**Directions.**—The mid-channel course should be kept when navigating Principe channel, until nearing Angai island, when the south shore should be neared to avoid the dangers which extend off that island.

**Soundings.**—The depths in Principe channel are from 66 fathoms, sand, to 140 fathoms, rock.

**Tides.**—The flood approaches principally by Estevan sound, being joined in Nepean sound by the stream which enters through Otter passage. At the western end of Principe channel this stream is met by the flood which has passed up outside Banks island. The ebb stream runs out principally by the Otter passage. Both streams attain the velocity of 3 knots an hour at springs.

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## CHAPTER V.

## OUTER COAST, CAPE CALVERT TO OGDEN CHANNEL.

## VARIATION, in 1883.

Cape Calvert,  $24^{\circ} 55' E.$ | Ogdén Channel,  $26^{\circ} 10' E.$ 

**CALVERT ISLAND.**—\* The coast of Calvert island is but little broken on its southern and western shores; which are comparatively low, and thickly wooded.

**Sorrow Island**, situated at the pitch of cape Calvert, the south extreme of Calvert island, is conspicuous (and an excellent thick-weather mark) from its cliffy formation, and by being covered with stunted, weather-beaten trees.

**Mark nipple**, an isolated hill (350 feet) at the south-west extreme of Calvert island, is a very useful landmark when approaching Fitz-Hugh sound.

**Landing**, with fine weather and off-shore winds may be effected in Grief bay (north of Sorrow island) and in other bights, westward to Herbert point the S.W. extreme of the island, about 8 miles distant. For directions for North channel, *see* page 10.

**Blakeney islet**, is small, wooded and about half a mile long, lying 5 cables from the south-west extreme of Calvert island.

**Fitz Roy reef**, the most outlying danger off the western shore of Calvert island, uncovers at low water, and is about 5 cables in extent in an east and west direction. Its outer or western edge lies W. by N. distant  $1\frac{1}{2}$  miles from Blakeney island; and  $1\frac{1}{2}$  miles from the nearest shore of Calvert island.

**Carrington reefs** are a cluster of sunken rocks, the outer edge of which lies 5 cables from the western shore of Calvert island, at  $1\frac{1}{4}$  miles northward of Blakeney island.

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\* *See* Admiralty chart:—Cape Caution to port Simpson, No. 19,236B; scale,  $m = 0.25$  of an inch.

The coast of Calvert island, northward of the Carrington reefs, is foul to the distance of 5 cables.

**Kwakshua** is an unexamined channel lying between Calvert and Hecate islands. At its western entrance this passage is 5 cables wide, and takes a north-easterly direction. (See page 13.)

**Kwakshua rock** lies nearly in mid channel, at the western entrance of Kwakshua channel. The sea only breaks at intervals over this dangerous sunken rock.

**Hecate reefs** fringe the western shore of Hecate island to the distance of 8 cables.

**HAKAI CHANNEL** between Hecate and Nalau islands, is about 7 miles long in a general N.E.  $\frac{1}{2}$  N. and S.W.  $\frac{1}{2}$  S. direction, and from one to  $1\frac{1}{2}$  miles wide. (See page 13.)

**Sugar loaf hill**, on the western side of Hecate island, is 500 feet high.

**Leading peak** lies about  $1\frac{1}{2}$  miles southward of Sugar loaf hill, and is of triangular shape, with a sharp, well-defined summit.

**South pointers** are a cluster of bare black rocks, of small extent, 2 feet above high water, and surrounded by sunken dangers to the distance of 2 cables, these rocks lie on the south shore, at the western entrance of Hakai channel,  $1\frac{1}{2}$  miles westward of the Starfish group.

**North pointers** are a cluster of bare rocks, of light colour, lying on the north shore at the western entrance of Hakai channel. The western or outer rock lies N.N.W. distant  $2\frac{1}{2}$  miles from South pointer rocks.

**Starfish group**, wooded, from 70 to 150 feet high, lie on the south shore, and extend about  $1\frac{1}{2}$  miles in a north-east and south-west direction.

The group consists of three principal islands, much broken into long, rocky, narrow creeks, with shores of white cliffs.

**Starfish ledge**, over which the sea usually breaks, lies 2 cables from the north-west shore of the northernmost Starfish island (Long island).

**Breaker group** situated on the north shore in the middle of Hakai channel, is about one mile in extent, the larger islands being wooded, about 250 feet high, and the smaller bare.

**Breaker ledge** uncovers at half ebb, and lies 5 cables south-east of the centre island of the Breaker group.

**East rock** situated on the south shore, off the mouth of Welcome harbour, is awash at low water, and lies half a mile off shore, N. by E. distant 5 cables from the western entrance point, and N.W. by N. distant 5 cables from the eastern entrance point of that harbour.

There are depths 23 and 25 fathoms close to East rock, and 30 fathoms between that rock and Port reef.

**Port reef** is awash at high water, and lies E.  $\frac{1}{2}$  S. distant 2 cables from East rock.

**Clearing marks.**—Leading peak (head of Welcome harbour) seen in line with Bluff point (north side of Welcome harbour) bearing S.S.E. will lead westward, and South pointers rocks S.S.W. will lead northward of these rocks.

**Choked passage** lies southward of the Starfish group; it is obstructed by rocks awash, reefs, and sandbanks.

**WELCOME HARBOUR\*** situated on the south shore of Hakai channel near its western end, is 3 cables wide at its entrance, and  $1\frac{1}{2}$  miles long in a S.S.E. direction. Though somewhat confined, it affords good shelter to small vessels. Within the harbour, on the north shore, there is a sandy beach; where a vessel might be beached. Strong westerly winds send a swell into this harbour.

**Fairway rock**, with 24 feet water over it, lies nearly in mid-channel at the mouth of Welcome harbour. There is a depth of 20 fathoms close westward, and of 9 fathoms close eastward of the rock.

Leading peak seen just northward of Bluff point bearing S.S.E., will lead eastward; and Sugar Loaf hill, seen in line with Leading island, a small, round, wooded island within the harbour, will lead close westward of Fairway rock.

**Harbour ledge**, situated one cable from the western shore of Harbour island, is of small extent, and dries 4 feet at low water.

**Codfish rock**, with 12 feet water over it, lies 100 yards off the south shore of Harbour island.

**Wolf rock**, awash at high water, lies close to the north shore, at one cable westward of Sandspit point.

**Sandspit point** has a sandspit extending from it one cable.

**Directions.**—Having passed not less than 5 cables northward of Starfish group, the leading mark before given for clearing East rock should be brought on and steered for.

Especial care will be necessary if the flood stream be making.

Having cleared East rock, pass east or west of Fairway rock † as requisite, and anchor in 7 to 9 fathoms off Sandspit point, in mid-channel between Leading island and Wolf rock, with the former bearing N.W. distant one cable.

**Exposed bay**, on the south shore, abreast Breaker group, has a dangerous cluster of sunken rocks near the middle of the bay.

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\* See Admiralty plan :—Welcome harbour, on sheet No. 1462.

† Fairway rock is marked by kelp during the summer months.

**Soundings.**—At 2 miles south-west of North pointer rocks there is a depth of 65 fathoms, sand. Approaching Hakai channel from that position the water will shoal to 40 fathoms, but will deepen to over 100 fathoms when within the channel eastward of a line joining North and South pointers rocks. There are depths of 125 and 104 fathoms eastward of that line.

**Tides.**—The flood approaches from the south-westward. Both streams attain the velocity of 4 knots an hour at springs.

**Directions.**—Hakai channel is not recommended to a stranger. If using it, steer midway between North and South pointers rocks; thence a mid channel course (N.E.  $\frac{1}{4}$  N.) towards a conspicuous mountain on the eastern shore of Fitz-Hugh sound, which will lead through into that sound.

**NALAU PASSAGE** between the Nalau group and Hunter island, is obstructed by islands, islets, rocks awash, and sunken dangers, and is useless for navigation. (See page 13.)

**White Cliff island**, situated W. by N.  $\frac{1}{2}$  N., distant 4 miles from the western or outer North Pointer rock, is of small extent, bare, and 250 feet in height; its shores consisting of high white cliffs, render it conspicuous when seen from the south and west.

**QUEEN'S SOUND** situated between Goose and Hunter islands, is about 12 miles long in a N. by E. and S. by W. direction, and from 4 to 8 miles wide.

At its northern end lie a labyrinth of islands and islets, which render that portion of the sound intricate and dangerous.

**Soundings.**—At the mouth of Queen's sound there are depths of 73 and 76 fathoms, sand; and within the sound no bottom could be found at 40 fathoms at one mile from the shore.

**Spider island**, 250 feet high, situated on the eastern shore, at the entrance of Queen's sound, 3 miles northward of White Cliff island, is  $3\frac{1}{2}$  miles long, in a N.N.W. and S.S.E. direction, and  $1\frac{1}{2}$  miles broad, it is connected with Hunter island by a ledge of rocks awash, through which there are boat passages, and its north-west extreme terminates in high, bold, white cliffs. The shores of Spider island are broken into numerous narrow rocky creeks.

**Superstition point** on the eastern shore of Queen's sound,  $2\frac{1}{2}$  miles northward of Spider island, is the south-west extreme of a small island, which is connected by a narrow neck, awash at high water, with Hunter island.

**Superstition ledge** consists of high rocks, connected by rocks awash and sunken dangers, the outer extreme of which lies S.W., distant  $1\frac{1}{4}$  miles

from Superstition point. Strong tide races will be met with in the vicinity of this ledge, and the sea breaks upon it heavily at times.

**PURPLE BLUFF**, the south-west extreme of a group of islands, on the eastern shore of Queen's sound, at the mouth of Plumper channel, terminates in high, bold, basaltic cliffs of a purple tint. The group consists of a labyrinth of islands, islets, wooded and bare, rocks awash, and sunken rocks, extending over a space of nearly 5 miles.

Purple bluff lies 5 miles north-west of Spider island, and is distant 5 miles from the Goose island group.

**GOOSE ISLANDS**, on the western shore of Queen's sound, consist of 4 principal islands, connected at low water, the largest and northernmost island is 250 feet high, wooded, and its north-east extreme terminates in conspicuous high white cliffs.

**Yellocki** is an Indian fishing village, situated on the eastern side of the westernmost Goose island.

**Gosling rocks** consist of numerous rocks, awash at high water, and sunken dangers, the outer extreme of which lies nearly 4 miles S.S.E. of the southernmost Goose island.

**West rock**, awash at high water, lies one mile south-west of the westernmost Goose island.

**PLUMPER CHANNEL** lies between Hunter and Campbell islands, and leads from Queen's sound into Lama passage. Its southern end is obstructed by numerous islets and rocks; and no specific directions can be given for entering the Plumper channel.

As a general guide, however, if the conspicuous white cliff on the north-easternmost Goose island be kept bearing S.W. astern, it will lead towards the mouth of Safe passage. Thence the chart and eye must be the guides.

**HECATE CHANNEL** lies between Campbell island and the Bardswell group, and leads from Queen's sound into Seaforth channel. This channel is also obstructed at its southern end by numerous islets and rocks. The two principal passages are Codfish passage and Brown narrows. No directions can be given for entering them, and the remarks concerning Plumper channel apply also to Hecate channel.

**BROKEN GROUP** (Qual-a-quate), situated 2 miles northward of the Goose island group, extend 2 miles in a N.N.W. and S.S.E. direction, and consists of several islets and rocks, connected throughout by ledges which uncover at low water.

**Fingal island** is a small wooded island lying one mile W. by N. from the northernmost island of the Broken group.

**Fingal ledges** extend one mile in a southerly direction from Fingal island, and consist of rocks awash, and ledges which uncover at low water.

**Peveril rock** lies  $1\frac{1}{2}$  miles N.N.E. from the northernmost Goose island, and is awash at high water.

**Middle rock**, 6 feet high, lies N.W. by W.  $\frac{1}{2}$  W. distant 3 miles from the north-west extreme of North Goose island, and W. by S. distant  $2\frac{1}{2}$  miles from the south island of the Breaker group.

There is a depth of 29 fathoms, rock, at 5 cables southward of the rock.

**North breaker** is a dangerous sunken rock, lying N.N.W. distant one mile from Middle rock. There is a depth of 27 fathoms, rock, at one mile westward of the North breaker.

**Limit island** is a small wooded island, with foul ground extending 5 cables south-west of it.

**Rempstone rocks** consist of two patches awash at high water, one mile apart, lying E. by S. and W. by N. of each other.

The western or outer rock lies south-east, distant  $1\frac{3}{10}$  miles from cape Swain.

**BARDSWELL GROUP** lie on the eastern side of Milbank sound, and consist of low, wooded islands, extending over a space 7 miles square. Among the group are several boat channels, communicating between Milbank sound and the Seaforth and Hecate channel.

**Aristazable island** situated on the western shore of Laredo sound, is about 26 miles long in a N.W. and S.E. direction, from one to 10 miles broad, and wooded. At about 8 miles from its south-east extreme there is a conspicuous saddle-shaped hill 640 feet high. Near the western end of the island, over the north shore, a bare ridge of hills, with 4 conspicuous peaks, rises to the height of 950 feet.

Over the south extreme of the island there are some bare hills 350 feet high, and at the extreme western end of the island there is a remarkable boulder or nob lying on the summit of bare hill. The southern shores are broken into bays and creeks, obstructed by islets and sunken rocks; and there are several off-lying groups of islands.

**Entrance island**, situated  $1\frac{1}{2}$  miles southward of the south-east extreme of Aristazable island; and W.N.W., distant 16 miles from Outer island (entrance of Milbank sound), has a small islet lying close south of it, and is the outer island of a group which extends from the south-east point

of Aristazable island. The larger islets of the group are wooded, the smaller bare.

**White rock**, 100 feet high, bare and conspicuous, situated N.W. by W., distant 3 miles from Entrance island, is the outer rock of a group extending 2 miles from the shore of Aristazable island.

**Sentinel island**, 250 feet high, small, round, wooded, and conspicuous, lies off the south point of Aristazable island, at  $1\frac{1}{2}$  miles from the shore; and W.  $\frac{1}{2}$  N., distant 4 miles from White rock.

Between Sentinel island and the nearest island of the group east of it, distant 5 cables, there is no bottom at a depth of 40 fathoms.

Several rocks awash and sunken rocks lie northward of Sentinel island, fringing the south shore of Aristazable island.

The two most outlying rocks, which are from one to 2 feet above high water, lie respectively W. by N. distant one mile, and W.N.W. distant  $4\frac{1}{2}$  miles from Sentinel island.

**GANDER ISLANDS** (Cha-che-Kwas) are a group of islands, islets, and rocks, extending over a space 10 miles long in a N.N.W. and S.S.E. direction, and 4 miles wide; at about 6 miles from the south shore of Aristazable island. The larger islands of the group are wooded, the smaller ones bare; and the tops of the trees are from 70 to 150 feet above high water.

**North Gander island** is the northernmost and largest of the group, is about 2 miles long in a N.N.W. and S.S.E. direction, and half a mile broad.

**Middle Gander islands** are two small, wooded islands, lying close together, the northern island lying S.S.E. distant 5 miles from the south extreme of the North gander island. A bare rock, with sunken rocks surrounding it, lies N.W. by N. distant 2 miles from the Middle gander islands.

**South Gander island** lies S.S.E. distant one mile from the Middle Gander islands. It is  $4\frac{1}{2}$  miles long, in a N.N.W. and S.S.E. direction, half a mile broad, 70 feet high, and wooded.

**South-east Gander islands**, 100 feet high, are two small wooded islands lying close together, S.E. by E., distant 3 miles from South Gander island. Two small bare rocky islets lie 2 miles north-west of South-east Gander islands.

**Goose ledge**, which uncovers at low water, lies S. by W. distant 3 miles from South-east Gander islands, and S.E.  $\frac{1}{2}$  S., distant 3 miles from South Gander island.



**Sparrowhawk breakers\*** lie, respectively, 4 and  $6\frac{1}{2}$  miles S. by E. from South-east Gander islands.

There is a depth of 21 fathoms between these reported dangers.

**Tide rip islands** consists of two groups lying N.N.W. and S.S.E. distant 2 miles from each other; the southern group lying 2 miles north-west of the Gander group.

These islands, which extend over a space of about 7 miles in a N.N.W. and S.S.E. direction, are wooded, about 200 feet high.

The northern and largest island of the group terminates at its north-west extreme, in high, white conspicuous cliffs.

**Tides.**—The flood runs from the southward. Both flood and ebb streams attain at springs, among these islands, a rate of 4 knots an hour.

**Soundings.**—Westward of Laredo sound, no soundings have been taken beyond the distance of one mile from the south shore of Aristazable island. The depths obtained at that distance were 23 fathoms and no bottom at 40 fathoms.

**CAUTION.**—Circumstances did not permit of an extended examination being made of the Gander and Tide rip groups and their vicinity. The water in the channels passing through them is deep; but the tides are strong. Those channels should, therefore, not be attempted by a stranger. And when approaching those groups of islands, the lead and look-out should be attended to.

**ESTEVAN ISLAND**, situated 6 miles westward of the Tide rip group, is about 14 miles long in a general W. by N. and E. by S. direction, and from 2 to 5 miles broad. The southern shores of the island are comparatively low, wooded, and much broken into bays and creeks. Near the centre, on the north shore, the land attains an elevation of 1,500 to 1,700 feet, forming a mountain of saddle-shape with the highest part to the westward.

The northern shores of Estevan island have already been described. (See p. 87.)

**HAYCOCK ISLAND**, small, bare, and 60 feet high, lies S.E.  $\frac{1}{2}$  E., distant  $4\frac{1}{2}$  miles from Curtis point; and W. by S.  $\frac{1}{2}$  S., distant 7 miles from Breaker point (eastern extreme of Estevan island).

**Haycock rocks** are three rocks awash, which lie respectively W. by S., S. by E., and N. by E., distant one mile from Haycock island.

The passage between Haycock island and Estevan island, should not be attempted.

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\* H.M.S. *Sparrowhawk* passed between and reported these breakers in 1869.

**Curtis point**, on the south shore of Estevan island, is low and wooded, with some rocky islets close to ; this point lies N.W.  $\frac{1}{2}$  W., distant  $4\frac{1}{2}$  miles from the summit of Haycock island.

**Curtis rock**, a dangerous sunken rock, over which the sea breaks occasionally, lies S.S.W., distant one mile from Curtis point.

**Cox point**, the west extreme of Estevan island, lies 5 miles westward of Curtis point. With the exception of a small bay at one mile westward of Curtis point, the shore between Curtis and Cox points is but little broken.

**Marchant rock**, over which the sea breaks at low water, lies South 2 miles from Cox point, and  $1\frac{3}{4}$  miles from the nearest shore of Estevan island.

**Cone islet**, small, wooded, 250 feet high, and conical, is the southernmost of the Block islets, and lies at the southern entrance of Otter passage, at 2 miles from the shore of Banks island.

**Breaker islets**, which lie off the eastern end of Banks island, at one mile westward of Cone islet, consist of a group of islets and rocks awash, the highest islet being about 70 feet high and wooded.

**BANKS ISLAND** situated 2 miles westward of Estevan island, is about 41 miles long, in a general W. by N. and E. by S. direction, and from 5 to 10 miles broad. The southern shore is wooded and comparatively low, seldom exceeding the height of 150 feet. This shore is broken into bays and creeks, rendered useless as anchorages by numerous rocks awash, and sunken dangers.

The northern shore is high and bold, with a mountain range of 1,000 to 1,760 feet over it ; the latter elevation being attained near the northern shore, at about midway between the east and west extremes of the island.

At about 10 miles from the western end of Banks island the land becomes low and flat, and is intersected by many creeks.

**Calamity bay** at the eastern extreme of Banks island is 3 miles wide at its entrance, and extends 3 miles in a north-westerly direction, it consists of iron bound shores, with rocky islets and sunken dangers occupying the bay nearly throughout.

**Terror point**, the south-east extreme of Banks island, is high and bold, 200 feet above high water. From its outer extreme this point slopes inland, and makes an island.

**Terror rocks** consist of rocks awash and sunken rocks, over which the sea breaks heavily, extending one mile south-eastward from Terror point.

**Shrub islet** of small extent, 80 feet high, with a conspicuous patch of bush upon its summit, lies south-west distant 3 miles from Terror point. Shrub islet has sunken rocks surrounding it to the distance of 3 cables.

**Grief point**, situated N.W. by W.  $\frac{1}{2}$  W., 8 miles from Terror point, is low and wooded.

**Grief ledge**, consisting of rocks awash and sunken dangers, extends  $1\frac{1}{2}$  miles south-west of Grief point.

The coast between Terror and Grief points has foul ground extending off it to the distance of one mile.

**Foul bay** lies between Grief and Wreck points, and is 5 miles wide and 2 miles deep. This bay is useless as an anchorage, being obstructed by islets, rocks, and sunken dangers.

**Wreck point**, a conspicuous projection from Banks island, is low and wooded lying W. by N., distant 5 miles from Grief point.

**Junk ledge**,\* consisting of rocks awash, and ledges which uncover at low water, extends nearly 2 miles south-east of Wreck point.

**North Danger rocks** lie 7 miles southward of Wreck point. This dangerous cluster consists of five bare rocks of small extent, 10 feet above high water, and surrounded by rocks awash and sunken rocks to the distance of 5 cables.

The centre of this dangerous cluster lies S.E. by E.  $\frac{1}{2}$  E., distant 18 miles from the summit of Bonila island. Vessels should keep southward of the line joining Shrub islet and North Danger rocks, and not pass between those dangers and Banks island.

**Kelp point** lies W. by N., distant 8 miles from Wreck point.

**Kelp ledge** extends  $1\frac{1}{2}$  miles southward of Kelp point. Between Wreck and Kelp points the shore of Banks island is foul to the distance of one mile.

**Halibut rocks** consist of two dangerous clusters (conv. at high water) about 5 cables each in extent, lying W.N.W. and E.S.E., distant  $1\frac{1}{2}$  miles from each other.

The centre of the eastern cluster lies E.S.E., distant 9 miles from the summit of Bonila island, and S.E. by S., distant  $4\frac{3}{4}$  miles from Cliff point.

**Cliff point** lies west by north distant 6 miles from Kelp point, and terminates in high, bold, white cliffs. Three small rocky islets lie near the shore close eastward of the point.

**South rocks** lie to the southward of Bonila island, and consist of two clusters of rocks awash at high water, of small extent, lying S.S.E. and N.N.W., distant one mile from each other.

The south or outer group, over which the sea usually breaks heavily, lies S.S.E. distant  $3\frac{1}{10}$  miles from the summit of Bonila island.

**High water rocks** lie nearly midway between Bonila island and Banks island (Cliff point). The cluster consists of six rocks, awash at high water, about 2 cables in extent, at  $2\frac{1}{4}$  miles E.  $\frac{1}{2}$  S., from the summit of Bonila island.

**BONILA ISLAND**, situated 9 miles S.S.E. from the N.W. point of Banks island, and 4 miles from the south shore of the island, is an excellent landmark.

The island is about 2 miles long, in an east and west direction, and one mile broad. On its eastern shore lie two small bays, with some rocky islets lying off their mouths, 2 cables from the shore. Near the centre the island reaches an elevation of 550 feet. The summit is dome-shaped, falling almost perpendicularly on its north and south sides, but sloping gradually to the westward. From this peak, an excellent view of the adjacent coast and off-lying dangers may be obtained. During the summer months, the sides of Bonila peak are clothed with purple-tinted heather.

**Landing** may be effected at the head of the southern small bay on the eastern side of the island.

**North-west rocks** are a cluster half a mile in extent, lying N.W. by W. distant 2 miles from the summit of Bonila island. The highest rock is 3 feet above high water.

**North rocks** are a cluster, about 5 cables in extent, awash at high water, and lie E.N.E. distant  $1\frac{1}{2}$  miles from the centre of North-west rocks; and N.N.W. distant 2 miles from the summit of Bonila island.

**Middle rocks** are two clusters, awash at low water, lying respectively W.N.W. distant  $1\frac{1}{2}$  miles, and N.N.E. distant 2 miles from the summit of Bonila island.

**WHITE ROCKS** lie close to the shore at the western extreme of Banks island, the two largest rocks are about 30 feet above high water, bare and conspicuous, with several smaller rocks surrounding them.

They form an excellent landmark when making Ogden channel from Hecate strait.

The coast between White rocks and Cliff point, and between those rocks and Deadman islet, is much broken, with several creeks running inland.

**Anchorage** for small craft in fine weather is stated to exist close northward of White rocks at the mouth of a creek.

**Supplies.**—Game abounds on all the off-lying islands. Notwithstanding the presence of wolves, deer are in great numbers, especially on the southern shores, which appear to be their favourite resort.

Water is plentiful at all seasons, the source apparently being springs.

Trout may be procured in the streams.

Berries, especially the whortleberry, cranberry, and wild raspberry, were found in abundance during July and August (1869).

Cedar and pitch pine were the principal woods met with.

**SOUNDINGS.**—On the seaboard, between Calvert island and Milbank sound, at the distance of 4 to 5 miles from the shore, the soundings are from 53 to over 100 fathoms.

At a distance of 5 miles westward from Blakeney island there is a depth of 54 fathoms, reddish sand, deepening to 76 and 89 fathoms, fine brown sand, to abreast Hakai channel.

At 2 miles southward from White Cliff island, there is depth of 70 fathoms, sand. Proceeding westward from that position across the mouth of Queen's sound, the depths will be from 70 to 76 fathoms, sand; there being a depth of 72 fathoms, mud and sand, at 7 miles southward of the Goose island group. From the last position proceeding in a north-westerly direction, passing 5 miles westward of the Goose island group, the water will deepen to 78 and 80 fathoms, mud and sand, and occasionally shells and stones.

With cape Swain bearing N.N.E., distant 4 miles, the water will deepen quickly to 105 and 109 fathoms, rock, off the mouth of Milbank sound.

**OGDEN CHANNEL,\*** situated between Pitt and Poreher islands, is about 16 miles long, and from 4 cables to  $1\frac{1}{2}$  miles wide. This channel affords the shortest means of communication between Queen Charlotte islands (Skidegate) and the inner waters. At its southern end, Ogden channel is divided by Spicer island into two passages (Schooner, and Beaver passages); and at one mile northward of Spicer island, the channel is obstructed by a group of islands (Channel islands) which reduce the navigable channel to 4 cables wide.

The water, however, in the Ogden channel is deep; and the dangers (with one exception) are visible except at high water.

**Landmarks.**—On Dolphin island a mountain with an irregular broken summit rises to the height of 1,400 feet. South-east of that mountain, and close to the shore, lies a hill with a conical summit (False cone hill). Off the south shore of Dolphin island in the vicinity of False cone hill, lie two small islets. The western islet lies close to the shore and is bare; the eastern

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\* See Admiralty chart:—Ogden channel and adjacent anchorages, No. 1901; scale,  $m = 1$  inch.

islet lies about a mile off shore, is wooded and about 100 feet high (Sentinel island).

On the eastern side of Dolphin island, close to the shore, a hill with a conical summit rises to the height of 454 feet. This conical hill (Passage cone) is a useful mark for indicating Schooner passage. On the north-west side of Spicer island a saddle-shaped hill rises to the height of 800 feet.

Northward of the Channel group of islands, the land becomes higher. On the eastern shore, close northward of Alpha bay, a conical mountain (Anchor mountain) rises to the height of 1,934 feet. At one mile south of Alpha bay, there is a remarkable white patch on the rocky eastern shore.

On the western shore, abreast of Alpha bay, an extensive valley extends inland. At 3 miles northward of the valley rises a mountain 1645 feet high with vegetation denuded from its sides by landslips.

**Peninsula point**, the north-west entrance point of Ogden channel, is prominent, with a hill near its eastern extreme. Northward of the point there lies a bay about 5 cables wide, and one mile deep, in a westerly direction (Oona bay).

**Long island** consists of two low wooded islets lying close together at  $1\frac{1}{2}$  miles southward of Spicer island.

**Channel island** is a small wooded islet lying nearly midway between Long and Spicer islands.

**SPICER ISLAND**, situated between McCauley and Dolphin islands, is of triangular shape, the base being to the north, and  $2\frac{1}{2}$  miles long. The island near its centre attains an elevation of 827 feet. On its south-east side two small narrow bays lie in a north-westerly direction. And off its south-west side, at 5 cables from the shore, there is a cluster of islets and rocks, some wooded and others bare.

**Channel group** lies on the western shore, at one mile northward of Spicer island. The large islands are wooded, and the eastern islet of the group is small, bare, and conspicuous. Half-a-mile northward of the Channel group lie some small islets, one bare (White rock), and another covered with vegetation (False grassy islet).

**South twin islet** is a small wooded islet on the eastern shore, 5 cables from the eastern islet of the Channel group and one mile northward of Spicer island. This islet and the eastern bare islet of the Channel group indicate the navigable channel, which lies between them.

**North twin islet** resembles South twin islet from which it lies N.N.W. distant 5 cables. The tops of the trees on North twin islet are about 130 feet high. Several small islets lie between the North and South twins and McCauley island.

**BEAVER PASSAGE**, between McCauley and Spicer islands, is the wider and better of the two passages leading into Ogden channel.

At its western entrance Beaver passage is about 5 cables wide, and runs in a N.E. by N. direction for about  $4\frac{1}{2}$  miles, thence sharply to the N.N.W., towards the Channel group, for  $2\frac{1}{2}$  miles.

**North rock** is always visible, and lies nearly in mid-channel at the southern entrance of Beaver passage, 5 cables south-east of Long island.

**Connis rocks** lie on the western shore (and marked by kelp in the season) 3 cables from the north-east extreme of Spicer island. The outer of these rocks only covers at high water.

On the eastern shore, abreast Connis rocks, lies a small bare islet, at the mouth of a sandy bay.

**Soundings**.—There is a depth of 42 fathoms, rock and shell at the western entrance of Beaver passage, and no bottom at 20 fathoms within the channel.

**Directions**.—Having passed through in mid-channel between Long island and North rock, steer N.E. by N. for about  $4\frac{1}{2}$  miles; N.N.W. for about  $1\frac{1}{2}$  miles, and pass midway between South twin islet and the Eastern (bare) islet, of the Channel group.

Northward of the Channel group Ogden channel widens to nearly 2 miles. The shore on both sides has no known danger beyond 2 cables.

**SCHOONER PASSAGE**, between Spicer and Dolphin islands, is barely 2 cables wide in its narrowest part, and is about 3 miles long in a general north and south direction, with depths of 20 fathoms, to no bottom at 33 fathoms.

**Boys Rock**, a dangerous sunken rock, lies at the southern end of Schooner passage, 2 cables from the south-east extreme of Dolphin island. There is a depth of 49 fathoms, rock, at 2 cables south of Boys rock.

Sentinel island bearing W.N.W. will lead southward; and Passage cone hill bearing N. by W. will lead eastward of Boys rock.

**Directions**.—Having brought the clearing marks on for Boys rock, pass a cable westward of the two small rocky islets which lie 5 cables N.N.E. of that rock. Thence the mid-channel should be kept, and when abreast the north end of Spicer island, steer to pass midway between that island and the south islet of the Channel group. Pass eastward of the latter at a distance of 2 cables, and proceed as before directed for Beaver passage.

**Tides.**—The flood stream comes from the southward, and near the north end of Ogden channel divides, one part turning to the eastward into Grenville channel, the other continuing northward towards Skeena river. The ebb stream from Grenville channel, Chatham sound and Skeena river unite off the north end of Ogden channel, and pass out by it. The muddy water of Skeena is usually clearly defined against the blue water of Ogden channel.

Both flood and ebb streams, in the narrow portions of Ogden channel, attain the velocity of 4 knots an hour at springs.

**ALPHA BAY**, situated on the eastern shore, 4 miles within the north entrance of Ogden channel, faces the west, and is nearly one mile wide, but only 3 cables deep. Near its northern end a deep valley extends inland, and through it there flows a fine trout stream. From the south entrance point of this stream a sandspit extends 2 cables towards the north point of Alpha bay.

**Anchorage** may be found in 10 and 11 fathoms,  $1\frac{1}{2}$  cables from the nearest shore (Fish point), with the south entrance point of the trout stream bearing N.E. distant  $2\frac{1}{2}$  cables; and Anchor mountain over the north shore of the bay N.E.  $\frac{1}{2}$  N.; in this position the point on the western shore under Bareside mountain should be seen in line with north point of Alpha bay, bearing N. by W.  $\frac{3}{4}$  W.

**Tides.**—It is high water, full and change, in Alpha bay at Noon; springs rise 18 to 19 feet.

**Observation spot**, on north point, is situated in latitude  $53^{\circ} 52' 1''$  N.; longitude  $130^{\circ} 17' 34''$  W.

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## CHAPTER VI.

## PORTLAND AND OBSERVATORY INLETS AND PORTLAND CANAL.

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Variation, 28° Easterly in 1883.

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**PORTLAND INLET.\***—This arm of the sea extends from the north-east part of Chatham sound in a N. by E.  $\frac{1}{2}$  E. direction for 10 miles, thence N. by E. for 10 miles where it divides; one arm (Observatory inlet) continuing northward, and the other (Portland canal) taking a north-westerly and northerly direction. At its southern entrance, between Wales and Maskelyne points, the inlet is about 3 miles wide, and its shores are comparatively free from danger, beyond the distance of 2 cables.

**Landmarks.**—The shores of Portland inlet are high and bold, especially the eastern. Needle peak lies on the south-east side of Nasoga gulf. This remarkable mountain terminates in a sharp snow-clad pinnacle, 5,000 feet high. Northward of Nasoga gulf, the shores of Mylor peninsula are high, bold, and precipitous, rising almost perpendicularly from the sea to the height of 3,000 feet. On the western shore Entry peak on Wales island has been already described. (*See page 77.*) The mountains on Pearse island lie in ridges nearly parallel to the shore, and the land is lower than on the eastern shore of the inlet. Northward of Lizard point the western shore becomes low and wooded, flanked by mountains 1,900 to 2,200 feet in height.

**York Island** lies N.E. distant 5 cables from the north extreme of Wales island, nearly in mid-channel, between that island and Pearse island. It is small, wooded, 100 feet high.

Abreast York island, a channel leads westward communicating with Portland canal; and with a smaller channel extending in a north-west direction. This channel is obstructed by several islands and islets, which render the passage intricate.

**Compton island** lies at the north entrance of Work channel. This island is of triangular shape, with a base 2 miles long to the southward, the northern extreme of the island terminating in a long, low point. There is a boat passage into Work channel eastward of Compton island.

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\* *See Admiralty chart:—Port Simpson to Cross sound, No. 2481; scale, m = 0.15 of an inch.*

**Emma passage**, northward of Compton island, is 5 cables wide, and runs in an E.S.E. direction for 3 miles, thence N.N.E. 3 miles, and terminates in a sandy bay.

The depths throughout the latter arm are from 23 to 36 fathoms.

**Union bay** lies at the head of the south-east arm, and affords anchorage for small vessels in 20 fathoms, a cable from either shore.

**SOMERVILLE ISLAND**, 2,000 feet high, on the eastern side of the inlet, is  $8\frac{1}{2}$  miles long, in a N. by E. and S. by W. direction, and 3 miles broad. The shores of this island are wooded, and bold, the land on its western side rising almost perpendicularly from the sea. The island is but little broken, except on its north side, where there is a bay, with deep water in it, 5 cables wide, and one mile in extent, in a southerly direction.

**Elliott point**, the south extreme of Somerville island, lies N. by E. distant 4 miles from Maskelyne point, and E. by N.  $\frac{1}{4}$  N., distant  $3\frac{2}{5}$  miles from Wales point.

**Truro island** lies 2 cables from the south-west side of Somerville island. This island is about  $1\frac{1}{2}$  miles long, in a N. by E. and S. by W. direction, and nearly half a mile broad. The island is wooded, with bold shores, and culminates in two hills 800 feet high.

**Anchorage** was found by Vancouver off a small bay on the west side of Truro island, in "35 fathoms, soft bottom."

**Nob islet** is a small round wooded islet, 30 feet high, lying close to the western shore of Somerville island, distant 8 cables from the north extreme of Truro island. There is a remarkable white cliff just southward of Nob islet.

**Start point** is the north extreme of Somerville island, and lies abreast Lizard point,  $2\frac{3}{4}$  miles from it. The point is high, and bold, with a deep bay close eastward of it.

**Cliff point** lies N.  $\frac{3}{4}$  E., distant 7 miles from Wales point, and terminates in high cliffs. Immediately south of the point is a narrow creek, which extends some distance inland in a north-west direction.

**Lizard point** is a prominent point on the western shore, N.N.E., distant 3 miles from Cliff point. There are sandy bays close north and south of this point, extending back a considerable distance, giving to Lizard point the shape of a peninsula, and when seen from the westward, makes as an island. At  $2\frac{1}{2}$  miles northward of Lizard point there are some conspicuous red-brown earthy cliffs.

**Flat point** lies N.  $\frac{1}{4}$  E. distant  $5\frac{1}{4}$  miles from Lizard point. The shore between these points is wooded and comparatively low, and a similar conformation exists one mile and a half northward of Flat point.

**Portland point**, about 18 miles within the inlet, lies North distant 3 miles from Flat point. This point, which forms the turning point into the south-east arm of Portland canal, is high, bold and nearly steep-to.

**Ramsden point**, which divides Observatory inlet from Portland canal, lies N.N.E. distant  $2\frac{1}{4}$  miles from Portland point.

A dangerous cluster of rocks, awash, and sunken, extend to the distance of 4 cables south-east of Ramsden point, with depths of 120 and 126 fathoms, mud, at 4 cables from the north-east, and south-east sides.

**Steamer passage** lies eastward of Somerville island, with an average width of 5 cables. From its south entrance it runs in a N.E. direction for  $5\frac{1}{2}$  miles, with depths of 23 and 29 fathoms water throughout; thence N. by W. for 5 miles, the water deepening to no bottom at 39 fathoms.

**Khutzeymateen inlet** is an unexamined arm, 5 miles within Steamer passage. It is 5 cables wide at its entrance, and runs in an E.N.E. direction.

**Quinamass bay**, on the eastern side of Steamer passage, abreast the north end of Somerville island, is 5 cables wide at its entrance, and takes an easterly direction. At low water it is almost completely filled up with a sand-flat, rendering the bay useless as an anchorage.

**Nasoga gulf**, eastward of Mylor peninsula, extends in a north-easterly direction for 5 miles, is one mile wide, and terminates in comparatively high land. There is no bottom at 39 fathoms, in this gulf.

**Anchorage** will be found, near the head of Nasoga gulf, in 10 to 12 fathoms, sand, in mid-channel, 2 cables from the north shore.

**Mylor peninsula**, is a high and comparatively narrow strip of land on the eastern side of Portland inlet, between Nasoga gulf and Nass bay. The peninsula is  $9\frac{1}{2}$  miles long in a N. by E. and S. by W. direction, with an average breadth of 2 miles. A small islet (Ranger islet) lies off its south extreme, and there the land is comparatively low (450 feet); but it rises quickly to the height of 2,900 feet, and forms high, bold, precipitous shores. About one mile from the north extreme of the peninsula the land again begins to fall, and terminates in the low, wooded point (Low point), which forms the south-west entrance of Nass bay.

**Trefusis point**, the south extreme of the peninsula, terminates in high white cliffs.

**Ranger islet** is a small bare islet, which lies 3 cables from the shore of Mylor peninsula, at the mouth of Nasoga gulf.

**Soundings.**—The water in the southern portion of Portland inlet is deep, there being no bottom at 220 fathoms in mid-channel, at 2 cables from the western shore 99 fathoms, and at 2 cables from the eastern shore of the inlet 159 fathoms, mud.

**NASS BAY\*** on the east shore lies immediately northward of Mylor peninsula, at the mouth of Nass river. The entrance points of the bay lie north and south of each other, distant 2 miles. The bay preserves this width in an easterly direction for 3 miles, and then divides, one branch running in a north-easterly direction to the mouth of Nass river, the other in a south-westerly direction, forming Iceberg bay.

**Landmarks.**—Low point is wooded, flat and low. On the south shore of the bay, half a mile eastward of Low point, there rises a mountain 2,040 feet high, with a bare side facing the north-west (Landslip mountain).

**North point**, the north entrance point of the bay, terminates in a bold cliff; and one mile eastward is a deep valley (Mission valley) extending to the northward. On the western side of the valley, one mile back from the coast, a conspicuous mountain, 3,385 feet high, will be seen (mount Tomlinson). Through the valley a large stream runs, dividing near its mouth into two branches. East of the stream, at the mouth of the valley, stands Kincolith mission station. Fort point, the north-west entrance point of Nass river, terminates in white cliffs. And on the eastern side of the bay, some low, dark islands (Mud islands) will be seen.

**Kincolith** is a mission station, fronted by a sand-flat, which renders communication by boat, except at high water, almost impossible.

**Position.**—The observation spot at the east side of Mission valley is in latitude  $54^{\circ} 59' 26''$  N., longitude  $129^{\circ} 57' 36''$  W.

**Canoe flat.**—An extensive sand-flat commences at Fort point, and taking a south-westerly direction, forms a triangle, the apex of which lies 6 cables off shore, south-east of the mission station; thence it takes a north-westerly direction, and meets the shore half a mile westward of Kincolith.

An extensive sand-flat occupies nearly the whole of the eastern portion of the bay at low water. And the entrance into Nass river is obstructed by a bar upon which there is only 9 feet at low water.

The western portion of Nass bay is deep; but as the north shore is approached, it shoals suddenly from 45 to 15 and then 2 fathoms water.

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\* See Admiralty plan :—Nass bay, No. 2,190; scale,  $m = 3$  inches.

**Anchorage**, in fine weather, will be found off Kincolith, nearly in the middle of Nass bay, on the line joining the Mission station and Landlip mountain, in 10 fathoms, mud, about 8 cables from the north shore; with the mission flagstaff seen in line with the centre of Mission valley, bearing N. by E., and Leading point (south side of Nass river) seen just open of Fort point (north-west entrance of Nass river), bearing N.E. by E.  $\frac{1}{2}$  E.

**Caution.**—A strong ebb tide will be felt in this position, and care must be exercised in taking up a berth, Canoe flat being very steep-to, it is recommended to use the deep sea lead in approaching it.

**Tides.**—It is high water, full and change, at Nass bay at 1h. 5m.; springs rise 17 to 23 feet.

**ICEBERG BAY**, the south-west arm of Nass bay, is 3 miles long in a S.S.W. direction, and not less than 7 cables wide. The head of the bay terminates in a low swampy flat, fronted by a sand-flat, and is distant 3 miles across from the head of Nasoga gulf.

At the mouth of Iceberg bay the depth of 10 fathoms, and less, will be found; but as the head of the bay is approached the water will deepen to over 40 fathoms.

**Anchorage** may be obtained at the mouth of Iceberg bay, in 7 to 8 fathoms, mud, with the north-west entrance point of Nass bay (North point) seen in line with the north-west entrance point of Iceberg bay (Double islet point) bearing N.W. by W.  $\frac{1}{4}$  W., distant 3 cables from the latter.

**Directions.**—If taking up this anchorage, having rounded Low point at the distance of 3 cables, keep the south shore of the bay on board; pass one cable northward of Double islet point, and anchor with that point in line with North point, in the bearing and distance above given.

**Mud islands** consist of two small islands lying N.N.E. and S.S.W. of each other, distant 4 cables, the northern island is 145, and the southern 106 feet high. They lie parallel to the eastern shore, distant 6 cables from it.

**Nass river** flows into the north-east corner of Nass bay. The mouth of the river is obstructed by a sandflat, which dries at low water, and extends towards the mouth of Iceberg bay. The south-west extreme of this extensive flat (Ripple tongue) lies North, distant  $2\frac{1}{2}$  cables from Double islet point.

Within the river, the navigation is difficult and dangerous; and the channel at low water is barely available for large canoes. The Nass river, at its entrance, abreast Fort point, is  $1\frac{1}{2}$  miles wide; thence it runs E.N.E. for 7 miles; and N.N.E. for 7 miles, to abreast the Nass villages. The channel near the mouth of the river being tortuous, the distance by the

channel from Fort point to the Nass villages, is about 16 miles. The river continues in a north-easterly direction for 25 miles beyond the lower Nass villages, and there divides, one branch running in a north-westerly direction. Kilawálaks, the head of canoe navigation, is situated on the N.W. branch 40 miles from the lower Nass villages. There are said to be 600 natives at Kilawálaks. (1868.)

**Nass villages.**—The lower Nass villages are three in number, situated 16 miles within the entrance; the north and south villages are situated on islands, and are separated from the middle village at high water. The south, middle, and north villages are known, respectively, by the names of Kit-min-i-ook, Kit-lah-kum-ka-dah, and Kit-a-Kauze. The population of the three villages is about 500. (1868.)

**Tides.**—The time of high water at the lower Nass villages is uncertain, depending apparently upon the freshets down the river. There was no slack at high water, the water beginning to fall immediately it had ceased to rise (August 1868). At low water there was slack for one hour and a half. In the month of August the flood stream was not felt above the Middle bank, and from Indian report this is the case at all seasons.

**Ice.**—The river is reported to freeze over down to its mouth during severe winters.

Hudson Bay Company's trading store lies on the western shore, about one mile below the middle village.

The Houlikan, from which the nutritious oil is obtained, the principal sustenance of the Indians, are caught in great numbers during the spring. For this purpose, numerous fishing weirs are erected along the banks of the river, especially on the south shore.

**Directions.**—The Nass river is used by small coasting vessels after half flood. The navigable channel is tortuous, and it is recommended not to attempt the river until the strength of the flood tide has slackened. The channel is liable after freshets to change.

**OBSERVATORY INLET**, northward of Nass bay, is called by the Indians Kit-Sah-Watl. This inlet is generally speaking similar to the other inlets, in some parts however the shores are low, and wooded; the land rising at a few miles back to 4,000 and 5,000 feet high. The low wooded shore has an undergrowth of thick moss, overlying rock, and saturated with moisture, which renders travelling difficult.

Abreast the north-west entrance point of Nass bay, Observatory inlet is one mile and a quarter wide, and runs in a general northerly direction

for about 12 miles thence N. by W. for 4 miles, and widens to 3 miles abreast Salmon cove. Northward of Salmon cove, the inlet widens to 4 miles; and at the distance of 6 miles from the cove, is obstructed by several islands, islets, and rocks. At 10 miles from Salmon cove the inlet divides into two arms, one taking a north-easterly direction for 12 miles, the other a north-westerly direction for 15 miles; both arms terminating in low, wooded, swamps, fronted by mud flats.

**Salmon cove\*** lies on the western shore, 19 miles from Ramsden point and 39 miles from Wales point.

**Richard point**, the north point of Salmon cove, is a long, wooded, conspicuous projection. From its north-east extreme the land trends in a south-westerly direction, for  $1\frac{3}{4}$  miles, to the head of Salmon cove, which is barely 3 cables wide in that position.

A sandflat extends 2 cables from the south shore at the mouth of Salmon cove.

**Anchorage** was obtained by Vancouver in Salmon cove "in 31 and 35 fathoms water, muddy and small stony bottom. The points of the cove bore by compass N.N.E. and S. by E., and the nearest land W. by S.,  $1\frac{1}{2}$  cables distant, and the opposite shore of the inlet E.N.E. one mile distant."

Anchorage was also obtained by Vancouver, in 30 fathoms, on the eastern shore, one mile northward of Salmon cove. On two other occasions he anchored in Observatory inlet, in 85 and 45 fathoms respectively, "steadying with a hawser to the trees on shore."

**Soundings.**—The water in the reach south of Salmon cove is deep, there being over 100 fathoms in mid-channel. The shores are compact and steep, with no known danger beyond  $1\frac{1}{2}$  cables from the shore.

**Brooke island**,  $2\frac{1}{4}$  miles long and half a mile broad at its northern end, is low, and wooded. The south extreme of this island lies 4 miles northward of Richard point, and 5 cables from the eastern shore.

Several patches of rock, which uncover at low water, extend 5 cables northward of Brooke island.

**Paddy passage** is 5 cables wide, between Brooke island and the eastern shore. Near its northern end it is barely 2 cables wide, the navigable channel being reduced to that width by the ledges which extend northward from Brooke island.

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\* This cove was so named by Vancouver, from the abundance of salmon found in a stream which flowed into it.

**Frank point**, situated N. by W., 5 miles from Richard point, and  $1\frac{1}{2}$  miles from the western shore of Brooke island, is low, and wooded, between it and Richard point the land trends considerably to the westward, and forms near the latter point a bight nearly 2 miles deep. Northward of Frank point, the western shores are much broken, with several deep bays, which take a southerly direction.\*

**Xschwau** is the name of a salmon fishery which lies at the head of a small bay on the western shore, 4 miles northward of Frank point.

**Larcom island**, situated nearly in mid-channel, at the mouth of Hastings arm, is about 5 miles long, in a N.N.W.  $\frac{1}{2}$  W. and S.S.E.  $\frac{1}{2}$  E. direction, with an average breadth of 5 cables; its south extreme lying 6 cables north-westward of Brooke island. Larcom island is flat, wooded, and comparatively low. At its south-west end, there is an extensive lagoon.

The Channel westward of Larcom island, is obstructed near the north end of that island by several islets and rocks, and is only available for boats.

**HASTINGS ARM** passes eastward of Larcom island, and runs in a general N.W.  $\frac{1}{2}$  N. direction for 4 miles, thence westward for about one mile, and N.W. by N. for 9 miles, until it terminates at the head of the inlet.

This branch of Observatory inlet is from 5 to 10 cables wide. It terminates in the usual manner; a wooded swamp, fronted by a mud flat.

**Directions.**—The water in Hastings arm is deep, with no known anchorage ground. If proceeding into this channel, pass between Brooke and Larcom islands, taking care to avoid the foul ground which extends 5 cables northward of the latter; the mid-channel course is clear of danger.

**ALICE ARM** is the name of the eastern branch of Observatory inlet. From its junction with Hastings arm, it runs in a northerly direction 3 miles, N.E. 3 miles, E. by N. 4 miles, and N. by E. 3 miles, terminating in the usual manner. This arm is obstructed at its entrance by a small wooded island (Liddle island) which divides it into two channels 3 cables wide. There is a depth of 23 fathoms in mid-channel in the southern, and 16 fathoms in the northern of these passages.

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\* Vancouver camped in the bay nearest to Frank point. He states that having pitched his tent among the pine trees, "at least 20 feet above the surface of the water at our landing, and as we thought sufficiently without the reach of the tide, yet at about 2 " in the morning it flowed into our tents, and we were obliged to return to our boats."



Alice arm varies in width from 5 cables to 2 miles; the latter being at the head of the inlet. The flat at the head is extensive, and through it a large stream flows, flanked on its eastern side by mountains over 5,000 feet high.\*

**Perry bay**, situated on the eastern shore at the mouth of Alice arm, is  $2\frac{1}{2}$  cables wide, and takes a southerly direction for nearly a mile, with depths of 14 and 18 fathoms, mud bottom, in mid-channel.

Off its western entrance point lies a small islet (Sophy islet). At the head of the bay there is a salmon fishery (Muckshwanne).

**Tides.**—The strength of tide in Observatory inlet depends upon the freshets caused by the melting snow. Abreast Nass bay, the ebb runs with great strength, the blue water being clearly defined when meeting the muddy waters of the Nass river.

**PORTLAND CANAL** is about 62 miles long, and from one to  $1\frac{1}{2}$  miles wide. At its entrance, which lies about 20 miles from Wales point, Portland canal runs N.W. 6 miles North about 13 miles to abreast Camp point, thence in a direction varying from N.W.  $\frac{1}{2}$  W. to N.W.  $\frac{1}{2}$  N. for about 30 miles, and northerly for about 12 miles, until terminating at the head of the canal.

This inlet possesses the general characteristics of the other inlets on the coast of British Columbia. High land on both shores, terminating in low swampy land at the head of the inlet. Deep water; few and indifferent anchorages.

In places the mountains rise almost perpendicularly above the high water line to the height of 6,000 feet. Their summits were (August 1868) snow clad; and the melting snow produced many waterfalls and avalanches; the latter could be heard falling almost constantly during the day-time. With the exception of a few wooded valleys at the mouths of streams, the snow line was very low at midsummer, being within 20 feet of the high water line in some of the valleys on the western shore, and reaching to within 500 feet of the high water line on the mountain sides.

The head of Portland canal was found to terminate in the usual low, woody, swampy, land, with one or more rivers flowing through it.

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\* Vancouver met with friendly natives, whose village was at the head of this branch. Their language, in some respects, resembled that spoken at Queen Charlotte island.

The two rivers (Bear and Salmon) at the head of Portland canal are separated by a high ridge of bare mountains. On the east side of the valley of Bear river a mountain range extends in an east and west direction. Mount Disraeli, the highest peak of the range, is a snow clad pinnacle, 7,000 feet high. The delta of the Bear and Salmon rivers consists of a mud flat, which covers at high water, and extends over one mile from the mouth of the former river. This deposit of mud is nearly steep-to, breaking down suddenly to no bottom at 40 fathoms.

**Current.**—During the month of August (1868), a current of about one mile and a half an hour was observed, setting down Portland canal, to the distance of 25 miles below the mouth of the Bear river.

**Climate.**—The sun's rays in August, between 9 a.m. and 3 p.m., were very powerful, and reflected from the snow, caused occasionally intense heat. When the sun was obscured by the mountains, the atmosphere at once conveyed a sensation of chilliness.

During that month, just before sunrise, the thermometer registered 32° Fahrenheit, water left in basins within the tent being frozen during the night. The vapour developed by the heat of the sun during the early portion of the day, becoming condensed on the mountainous shores of the inlet, usually fell as a drizzling rain from 3 p.m. to about midnight.

**Temperature** of the surface water, within 20 miles of the head of the canal, was 33°. At that distance from the mouth of the Bear river the water on the surface was fresh.

**Supplies.**—Salmon, mountain sheep, bears, and berries abound at the head of Portland canal.

**Timber, &c.**—The pine and cedar were the principal trees met with. The former were tall, and almost bare to the top, and frequently above 100 feet high. The latter were found in many places of great size, with branches close to the ground. Maple trees were occasionally seen, being distinguished by their light and variegated tints of green. Yellow cypress was seen also, being distinguished from the pine by its leaf, convex on both sides, and by its peculiar odour.

The wood of the yellow cypress is light, tough, and durable, and useful for repairing or building boats.

**Natives.\***—A party consisting of about 200 natives were met with

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\* These Indians (apparently of the Nass tribe) were civil to the surveying party. By order of their chief they cleared the ground and helped to pitch the tent, brought the gear out of the boat, hauled her up, and placed canoes at the party's disposal.

fishing at the mouth of Salmon river. They annually visit the head of the Portland canal.

**South-east arm** leads from Portland inlet in a north-westerly direction for about 6 miles, with an average width of  $1\frac{1}{2}$  miles.

**Dogfish bay**,\* situated on the eastern shore, about  $3\frac{1}{2}$  miles from point Ramsden, is about  $1\frac{1}{2}$  miles wide, half-a-mile deep, and faces the south-west. This bay, being occupied by a sand-flat at low water, is useless as an anchorage.

A small islet (Windy islet) lies close to the shore at the north entrance point of Dogfish bay.

**Tree point**, on the western shore,  $4\frac{1}{2}$  miles from Portland point (south entrance point of Portland canal), is low, wooded, and conspicuous, with high land at about one mile south of it.

**Tree point reef** extends 5 cables in a northerly direction from Tree point, and is nearly steep-to.

**Spit point** lies on the eastern shore, distant 6 miles from Ramsden point, and is the turning point into the northern reach. Between Spit point and Dogfish bay several small wooded islets lie close to the eastern shore, and are connected with it at low water. A tongue of sand, which uncovers at low water, extends 3 cables south-west of Spit point.

**Reef island** is a small island lying on the western shore abreast Spit point. The summit of this island lies N.W. distant  $2\frac{3}{4}$  miles from Tree bluff; and W.S.W. distant  $1\frac{1}{2}$  miles from Spit point.

Two small bays, with sandy beaches, lie under Reef island, in which a boat may find shelter. A reef with rocks awash at high water, and sunken rocks, extends 2 cables south-east of Reef island.

From mid-channel between Reef island and Spit point, the canal runs North, for about 13 miles, with an average width of one mile. The eastern

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They had, they stated, never before met white men at the head of Portland canal, nor heard of any visiting it. Their canoes were manipulated with marvellous dexterity. When shooting the rapids, one man stood in the bow, and another in the stern, each armed with a long pole carried on opposite sides of the canoe. When nearing a boulder over which the torrent boiled, and when destruction seemed imminent, the man in the bow placed his pole in the ground, the current caught the canoe, reversing her end for end, clear of the danger.

\* Halibut weighing three hundredweight are caught off Dogfish bay. The Indians use for this purpose a large wooden hook, not unlike an anchor with one arm. The line is made of gut, and the bait is usually clam or other shell fish. The fish are caught in depths of 100 fathoms, and upwards.

shore of this reach is bold and unbroken, but on the western shore lie two small bays.

**Leading point** is a high, bold point, on the western shore, lying north,  $2\frac{1}{2}$  miles from Reef island.

**Dickens point**, is on the eastern shore, distant 4 miles from Spit point, with a considerable curve to the eastward in the coast between them.

A small black rock, 8 feet above high water, lies close south of Dickens point. A ledge of rocks which uncover, extends 2 cables from Dickens point.

**Sandfly bay**, situated on the western shore, abreast Dickens point, is 5 cables wide, and three-quarters of a mile deep in a north-west direction; terminating in a swamp with streams in the north-west and north-east corners. At the north point of the bay, two small islets lie close to the shore.

Sandfly bay is nearly occupied at low water by a sand-flat, with deep water close to, and is therefore useless as an anchorage.

**Stopford point** is bold and conspicuous, and lies on the eastern shore,  $3\frac{1}{4}$  miles from Dickens point.

**HALIBUT BAY** on the western shore, 4 miles from Sandfly bay, is 5 cables wide at its entrance, and extends back  $1\frac{1}{2}$  miles in a N.W. by W. direction. There is an extensive swamp at its head, through which three large streams flow. Off the south point of this bay lie a cluster of small black rocky islets.

**Anchorage**, the only known anchorage in Portland canal, will be found in Halibut bay, in mid-channel, 3 cables within the entrance, in 6 to 10 fathoms, mud bottom.

**Cross islet** is a small wooded islet, connected at low water with the shore, lying close northward of Halibut bay. A rude wooden cross was found on this islet, placed there at some remote period, apparently to mark a grave.

**Logan point** lies on the eastern shore,  $3\frac{1}{4}$  miles from Stopford point. A conspicuous saddle-shaped mountain, 4,800 feet high, lies 3 miles south-east of Logan point.

**Camp point** lies on the western shore, and is the turning point of the northern arm, which abreast of that point changes in direction from North to W.N.W. The point is wooded, bold, and precipitous.

**Centre island**, situated nearly in mid-channel, abreast Camp point, is 400 yards long in a north and south direction, with some stunted brush growing upon it.

A ledge of rocks awash, and sunken rocks, extend 2 cables northward of Centre island. The water is deep on either side of the island, beyond the distance of 2 cables from it. The channel westward of Centre island is recommended.

Barciay valley lies on the eastern shore, abreast Centre island; a large stream flows through the valley; and the neck of land separating Portland canal and Salmon cove (Observatory inlet) is here about 4 miles across.

**Landslip point** lies on the eastern shore, 2 miles northward of Centre island. Three conspicuous landslips are seen on the mountains south of Landslip point.

Bluff point terminates in a high bold cliff, and lies on the eastern shore, 2 miles from Landslip point. The channel abreast Bluff point is one mile wide.

**Breezy point**, on the western shore,  $3\frac{1}{2}$  miles from Camp point, is conspicuous, and the land recedes to the southward between Camp and Breezy points.

**Tombstone bay** lies on the western shore, N.W. by N. distant 3 miles from Breezy point. At its entrance, this bay is 3 cables wide, and takes a southerly direction, narrowing rapidly until it terminates at one mile within the entrance at the mouth of a river.

An extensive well-wooded valley lies at the head of the bay; and on the north side of the valley, a remarkable mountain, with a snow-clad summit of dome shape rises to the height of 6,500 feet.\* Trout are plentiful in the river flowing into this bay. Berries are found in abundance, especially salmon berries and the wild raspberry.

**Maple point** lies on the eastern shore, 3 miles from Bluff point. Maple trees grow upon this point, and when in leaf render it conspicuous. Immediately northward of Maple point lies a bay, with a large stream flowing into it, fronted by a sand-flat.

**Swamp point**, a low, marshy, wooded point, through which a river flows, lies N.W.  $\frac{1}{2}$  W. distant 3 miles from Maple point. A sandspit extends 5 cables to the southward of Swamp point.

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\* An Indian settlement once existed on the shores of this bay. The inhabitants had, apparently, been overtaken by an epidemic, as many skeletons were seen lying on the ground, with boxes and various chattels near them. A rude sort of tombstone had been erected near one of the skeletons.

Above Swamp point, the channel takes a general direction of N.W.  $\frac{1}{2}$  W., to abreast of White point.

**Pirie point**, situated N.W. by W., 2 miles from Swamp point, is high, bold, and conspicuous. A sandpit extends 2 cables from the eastern shore mid-way between Swamp and Pirie points.

**White point** lies on the eastern shore, 4 miles from Pirie point.

From abreast White point the channel takes a general direction of N.N.W.  $\frac{1}{2}$  W. for 7 miles, to abreast of Blue point.

Turn point lies on the western shore,  $1\frac{1}{2}$  miles from Tombstone bay. This point is high, bold, and conspicuous. Steep point on the western shore, 6 miles from Turn point, is bold and steep-to. Two large streams flow into the sea, mid-way between Turn and Steep points.

**Foggy point** lies on the western shore, N.W.  $\frac{1}{2}$  W., distant 6 miles from Steep point. The coast between Steep and Foggy points trends considerably to the southward in a deep curve. At  $2\frac{1}{2}$  miles southward of Foggy point an extensive valley lies in a southerly direction, between mountains from 3,500 and 4,000 feet high. The valley is thickly wooded, and through it a large stream flows.

**Bay islet** lies on the eastern shore abreast of Foggy point. This islet is small and wooded, and lies one cable off a point which divides two sandy bays, being connected with the point at low water.

**Green islets** are two small, wooded islets, on the eastern shore; distant 2 miles from Bay islet. Close northward of these islets there is a considerable tract of comparatively low land, thickly wooded, through which a large stream flows.

Slab point terminates in high, smooth, slate-coloured cliff, and lies on the western shore, 2 miles from Foggy point.

**Blue point** lies on the eastern shore,  $5\frac{1}{2}$  miles from Green islet; and  $1\frac{1}{4}$  miles from Cliff point (on the western shore). Blue point terminates in high, bold cliffs, of purple blue colour, and basaltic formation. Close south of the point, an extensive wooded valley extends to the north-eastward. Two large streams flow through the valley. A sandspit extends off their mouths to the distance of 2 cables.

**Cliff point** terminates in high white cliffs, and is steep-to. From mid-channel between Blue and Cliff points, the inlet runs in a N.W. direction for  $2\frac{1}{2}$  miles, N.N.W.  $\frac{1}{2}$  W. 3 miles, thence in a general northerly direction to its termination.

**Verdure point** lies N.W. by N., distant 4 miles from Cliff point.

The Maple trees growing upon this point, when in leaf, render it conspicuous. Mid-way between Cliff and Verdure points, there is an extensive wooded valley, through which a large stream flows in a south-westerly direction. Close northward of Verdure point lies a bay, with a conspicuous sandy beach at its head.

Landslip point lies N.W. by N., distant one mile from Verdure point; and is conspicuous by the high landslip over it.

**Round point** is the turning point, on the eastern shore, into the northern and last reach of Portland canal. With the exception of a small bay, which dries throughout at low water, the eastern shore northward of Blue point, for 6 miles, is high, bold, and almost inaccessible. The northern extreme of Round point lies 6 miles from Blue point.

**Seal rocks\*** on the western shore, at the entrance of the north reach of the canal, is of small extent, and lies 2 cables from the western shore. The highest rock is 6 feet above high water. Between Verdure point, and the point off which Seal rocks lie, the coast curves considerably to the westward. At one mile to the southward of the latter point, an extensive wooded valley takes a westerly direction, between high mountains, and a large stream flows through it.

Marmot river on the eastern shore,  $2\frac{1}{2}$  miles from the mouth of Bear river, flows through an extensive valley which lies in an easterly direction. A sandspit extends 3 cables off the mouth of Marmot river, and is steep-to. At the head of the valley, a mountain range with three conspicuous peaks, 4,000 to 5,000 feet high, lies in a north-west and south-east direction.

**Salmon river** lies on the western shore,  $1\frac{1}{2}$  miles from Bear river, and is separated from that river by a range of bare mountains, 4,000 to 5,000 feet high (Reverdy Johnson mountains). It is a stream of considerable size, and the valley through which it flows is half-a-mile wide at its mouth, the river then runs in a north-westerly direction, widening to one and 2 miles, and is flanked by high mountains. The north shore, near the entrance of the valley, is the headquarters (1868), during the fishing season, of a party of Indians (apparently of the Nass tribe).

**Bear river** flows through an extensive wooded flat, at the head of the Portland canal, and divides near its mouth, into several streams. During the summer months, when the snow is melting, a considerable body of water passes out of Bear river. The valley through which this river flows extends 10 miles in a northerly direction from the mouth of Bear river, and is thickly wooded. Flanked by mountains 4,800 feet high, (Gladstone mountains,) it terminates at the foot of a range lying in an east and

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\* Many fur seals were seen upon this cluster. (August 1868.)

west direction (Disraeli mountains). The Bear and Salmoa rivers have a mud flat extending across their mouths, rendering communication, even by canoes, difficult at low water. Commencing at about 3 cables south of Salmon river valley, this deposit of mud extends across the inlet in a north-easterly direction, passing over a mile from the mouth of Bear river. The edge of the bank is steep, breaking down almost suddenly to no bottom at 40 fathoms.

**Anchorage** was unsuccessfully searched for off the above-mentioned delta of the Salmon and Bear rivers. The depth of 24 fathoms was found alongside the edge of the mud at low water ; and at the distance of 50 yards from it no bottom could be obtained at 40 fathoms.

**Tides.**—It is high water all and change, at the head of Portland canal at 1h. 30m.; springs rise from 23 to 27 feet, and occasionally 30 feet. In August 1868 it was observed that the night tides rose considerably higher than the day tides.

**OBSERVATION SPOT**, at the wooded high-water mark, of the point near the centre of the mouth of Bear river, was found by observations, taken in August 1868, to be situated in latitude  $55^{\circ} 56' 3''$  N., longitude  $130^{\circ} 3' 27''$  W., depending on Shell island, Beaver harbour (fort Rupert), being in longitude  $127^{\circ} 25' 7''$  W.

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## CHAPTER VII.

## QUEEN CHARLOTTE ISLANDS.

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 VARIATION 26° Easterly in 1883.
 

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**GENERAL REMARKS.**—Queen Charlotte islands, consisting of three principal islands, may be regarded as a partly submerged mountain range, a line drawn from the southern extremity of the islands to their north-western point, representing its axis, and several smaller islands, forming a compact archipelago, situated between latitude 51° 50' and 54° 15' N., and longitude 130° 54' and 133° 10' W.\*

The channels between the main islands are named Houston Stewart and Skidegate, the former or southern channel separating Prevost and Moresby islands; and the latter, or northern, Moresby and Graham islands.

**Prevost island**, the southernmost, has a length north and south of about 12½ miles, with a breadth of 8½ miles. The land gradually rises northward from cape St. James till near Houston Stewart channel, where it has in places a probable elevation of 2,000 feet, and which, if the weather is clear, will be the first land seen in approaching Queen Charlotte islands from the southward. The east coast of Prevost island is bold, and in many places formed by a cliff facing the sea. This part of the coast, between cape St. James and East point, a distance of 12 miles, is indented by two bays or inlets, the southern apparently inconsiderable, while Luxana bay, the northern, is probably 3 or 4 miles in depth. From East point the shore runs north-westward 6 or 7 miles to Moore head, the south-east entrance point of Houston Stewart channel. The shore is much broken, being penetrated by inlets which run back among the high hills. Several small islands lie off it, one of which is bold, densely tree clad, and has a height of 150 feet. The western side of Prevost island, between cape St. James and the western entrance of Houston Stewart channel, for about 12 miles is apparently bold, but it is less known than the opposite side. The land near cape St. James is not as thickly wooded as that to the northward.

**CAPE ST. JAMES**, so named by Captain Dixon in 1787, who rounded the cape on St. James' day in the *Queen Charlotte*. The cape

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\* See Admiralty charts, Queen Charlotte islands, No. 2,430; scale,  $m = 0.13$  of an inch. Also, Cape Caution to Port Simpson, No. 1,923 *a* and *b*; scale,  $m = 0.25$  of an inch.

appears to be the southern extremity of an island one mile in diameter, the narrow channel separating it from Prevost island running W.S.W. and E.N.E. The southern point of cape St. James is a vertical cliff about the same height as the larger of the islets lying off it.\*

**Kerouart islets** received their name from La Perouse, and consist of a chain of rocky islets and rocks which run off from cape St. James  $3\frac{1}{2}$  miles in a south-easterly direction, corresponding with that of the mountain axis of the group. A sunken ledge is reported to extend  $1\frac{1}{2}$  miles further in the same direction. As seen at a distance of some miles to the north-east, Kerouart islets appear to form three groups, the first lying close to cape St. James, consisting of two large rocks, the second of one large and several smaller rocks, and the third and furthest southward of two or three rocks of some size and a number of lesser ones. These islets are remarkable, standing boldly up with rounded tops, and vertical cliffs on all sides, the smaller rocks having the same pillar-like form so frequently found where a rocky coast is exposed to the full sweep of a great ocean. They serve as secure breeding places for innumerable gulls, puffins, and other sea birds.

With cape St. James bearing W. by S.  $\frac{3}{4}$  S. about  $3\frac{1}{2}$  miles, and the northernmost rock above water S.W.  $\frac{1}{2}$  S. there is a depth of 90 fathoms. Precaution is necessary when approaching this part of the coast.

**HOUSTON STEWART CHANNEL** † trends from Moore head West  $2\frac{1}{2}$  miles to Hornby point, thence S.W. 3 miles to the entrance from the Pacific ocean. Opposite the bend formed by Hornby point is Rose harbour. Louscoone, at the west entrance of the channel and just within Anthony island, is said to be a good harbour similar to Rose harbour. The country round this locality is mountainous, generally rising steeply from the shore, and thickly wooded; the trees are stunted and show much dead wood; they grasp the almost naked rock. There is no arable land, and the little soil is poor. Sea otters are numerous, the fur of which fetches very high prices.

**Entering from the Eastward.**—This entrance may be known by its bold south point and the round thickly wooded islet. At about 4 miles from the entrance there are 90 fathoms water, and the depth gradually shoals to 20 fathoms to within a mile of it; from this distance off, the

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\* Captain G. H. Richards, H.M. surveying vessel *Hecate*, in his journal, September, 1862, remarks that "the cape slopes gradually from a summit 1,000 feet high to the sea, low at its extreme, with the Kerouart islets lying off it, two apparently detached hummock islets, about 180 feet high; outside these again lie three others, nearly 100 feet high, bare and whitish; the western side of the cape is also whitish."

† See Admiralty plans of ports in Queen Charlotte islands, No. 2,168.

soundings are very irregular, varying from 30 to 7 fathoms over a series of ridges or bars of rock, sand, shell, and mud. In the entrance, which is about a mile wide, between Moore head and Langford point there are 20 fathoms water, with a rocky bottom.

Within Forsyth point, at one mile westward of Langford point on the northern side, is a snug bay, bordered by a sandy beach, in which, at about two-thirds of a mile from Forsyth point, and at one-third of a mile from the beach is a secure and convenient anchorage in 16 fathoms. At a quarter of a mile inside Forsyth point and a little to the northward of the line of direction of the channel is a rocky patch with kelp on it, and which dries at low-water springs; a vessel, therefore, should not haul to the northward too soon after entering. In the north-west part of the bay is Raspberry cove, into which a stream of water flows.

On the southern side of the channel are some small wooded islands, here and there fringed with outlying patches of kelp, which latter should always be avoided. Trevan rock,  $1\frac{1}{4}$  miles W.S.W. from Forsyth point, lying nearly mid-channel, and contracting the passage on its northern side to rather less than half a mile; patches of kelp and Ellen island, the largest of the islands before mentioned reduces the channel on the southern side of it to about a cable in width. Close to the north side of Trevan rock the depth is 7 fathoms.

There is a good anchorage to the eastward of Ellen island,\* which was used by H.M.S. *Alert* in 1858, in a bay formed by the island and a rocky patch which covers at half tide, at nearly half a mile to the eastward of the island. The anchorage is in 14 fathoms, mud, and the tide is not felt.

**Rose Harbour.**—This secure and capacious harbour forms the northern arm of Houston Stewart channel. It runs up in a northerly direction between Catherine point on the west and Rose island on the east, for 3 miles from its junction with the channel, and is a continuation in nearly a straight line with the western portion of it. For the first 2 miles the average breadth of the harbour is three-quarters of a mile; the western shore rises boldly with deep water close-to; the eastern shore, although high, has kelp along it, with shoal water. The harbour then contracts to half a mile, between two low points forming its head. Beyond these points is a basin, about 2 miles in circumference, filled with rocks and woody islets, having on its western side Sedmond river, a small stream abounding in the season with geese and ducks. The land on its north and west sides is high and mountainous, whilst that on its eastern side is low. This basin is separated from South cove in Carpenter bay by a narrow neck of low wooded land.

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\* Navigating Lieutenant A. F. Boxer.

**Danger Rocks.**—About 3 miles to the northward of the eastern entrance to Houston Stewart channel, and at about 2 miles off the low and densely wooded point between the east entrance of Houston Stewart channel and Carpenter bay, is a ledge of rocks, lying a little above water; the sea breaks violently over them, and for a considerable distance around; other rocks encircle these, but they are under water. Approaching Houston Stewart channel from the northward, these rocks should be given a wide berth. On the north side of the low wooded point is a little cove full of kelp and protected by rocks, with an Indian house in it, which appears to be occupied at times.

**Entering from Westward.**—The southern arm of Houston Stewart channel is about 3 miles long, and three-quarters of a mile wide, with several small islands at its southern end or entrance from the Pacific. The shores of both sides are bold and densely wooded. A vessel coming from the southward and wishing to go in by this entrance, when abreast cape St. James, should close the land to  $1\frac{1}{2}$  miles, and after coasting it for about 12 miles, the entrance will open out. Two remarkable white stripes down the mountains, 6 or 7 miles to the north-westward, are excellent landmarks. After passing at a convenient distance to the southward of the largest and outer island at the entrance, named Anthony island, which is 200 feet high, with white cliffs (off the southern end of which an extensive ledge of rocks projects in a south-west direction), the channel will show itself. Flat rock, which is bare and resembling a haystack, 50 feet high, lies much nearer the western than the eastern side, and which should be kept on the port hand, will be a good guide.\* There is an Indian village known as Nin-stints, of the Shangoi tribe, on the inner side of Anthony island; the natives are very wild, and persons visiting or trading with them should be on their guard.

**Observation Spot.**—See foot-note †.

**MORESBY ISLAND**, the centre of the three principal islands, is 72 miles long, but the explorations have resulted by the tracings out of the channels on its east coast in leaving it a mere skeleton, in places varying from only  $1\frac{1}{2}$  to 2 miles in breadth. The highest and most rugged part of the island is probably in about latitude  $52^{\circ} 30'$ , where many peaks bear patches of perennial snow, and rise to altitudes surpassing 5,000 feet. Also on Louise island, and about the head of Cumshewa, the land is very rugged, with many summits exceeding 3,000 and 4,000 feet.

\* H.M.S. *Hecate*, September 1862, passed between Flat rock and Gordon islets, and anchored in Raspberry cove, on the north shore, in 16 fathoms.

† The observation spot in Raspberry cove (on the point just east of the stream) was determined by Captain G. H. Richards, H.M. surveying ship *Hecate*, in 1862, to be in lat.  $52^{\circ} 9' 22''$  N., long.  $131^{\circ} 4' 16''$  W., depending upon Shell island, Beaver harbour, Vancouver island, being in  $127^{\circ} 25' 7''$  W.

**CARPENTER BAY**, the southernmost bay on the east side of Moresby island. Between Iron point on its north-western, and Islet point on its south-eastern side, it is a little over 2 miles wide, and runs westward about 5 miles. On its south side are two small bays, the western of which, South cove, approaching near to the head of Rose harbour. In its head is good anchorage for a small vessel in from 6 to 10 fathoms. It is not quite land-locked, but sheltered from the only direction otherwise exposed by a little rocky reef which runs out from its east side.

Carpenter bay ends westward in a narrow arm, which receives two streams of some size. It resembles the head of Rose harbour in being filled with little rocky islands and rocks, making it unsafe for even a small craft. The general character of the country surrounding the bay is like that of Houston Stewart channel. In June there were many seals in the bay.

**Collison bay**, situated between Carpenter bay and Skincuttle inlet, is about  $1\frac{1}{2}$  miles wide between Bluff point, its south-east point of entrance, and the north-west point, and has a probable depth of 2 miles. It runs up into a narrow arm, which has not been examined. Several small islands and rocks lie in its mouth, and it does not appear to be serviceable as a harbour.

**Gull rock**, 10 feet in height, bears N.E. by E.  $\frac{1}{4}$  E.  $1\frac{1}{2}$  miles from Deluge point, and is three-quarters of a mile off Moresby island, between Collison bay and Skincuttle inlet. Inner Low rock lies S.S.E. from Gull rock, and midway between it and the shore.

**SKINCUTTLE INLET** is  $5\frac{1}{2}$  miles deep in a south-west direction, with a width of 4 miles between Deluge point on the south and Granite point on the north side of its entrance. The north side of the inlet is formed by Burnaby island, and from the north-west angle Burnaby strait runs northward to Juan Perez sound, and separates Burnaby island from the east shore of Moresby island. The shores of Skincuttle inlet resemble those of other parts of the islands already described. Near the north-west angle of the inlet the mountains rise steeply to a height of 3,000 feet or more.

The entrance to Skincuttle inlet is south of a chain of islands, called the Copper islands,\* lying E.N.E. and W.S.W. It is  $1\frac{1}{2}$  miles wide, but should be used with caution as there is reason to believe that a rock, sometimes

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\* A small shaft has been sunk and a few openings made in connexion with an attempt at copper mining. There is no true vein here, but magnetic iron ore, with a little copper pyrites.

See Admiralty plans, Ports in Queen Charlotte islands, No. 2. 68.

bare, lies in it. The passage to the north of the Copper islands is contracted, and with one or more rocks in its narrowest part.

**South side.**—The first opening on the south side of the inlet is Harriet harbour. It is 2 miles westward of the south entrance point (Deluge point) of Skincuttle inlet, and runs southward one mile. It should be entered by the channel on the west side of Harriet island, which lies at its mouth. A vessel should be kept nearer the west side of the channel (as several little rocks covered at high water lie along Harriet island), and run some distance beyond the inner end of the island before anchoring, to avoid the shoal bank which lies off its point. The depth is about 8 fathoms, with good holding ground, and the harbour is well sheltered from most directions, though subject to heavy squalls from the valley at its head when a southerly gale is blowing.\*

At  $1\frac{1}{2}$  miles west of Harriet harbour is Huston bay. This is a wide inlet which runs south-eastward about 4 miles, and then turns to the west, in which direction its extremity was not visited, but it approaches the western side of Moresby island to within about  $1\frac{1}{2}$  miles.

**Western end.**—At the western end of Skincuttle inlet are three indentations of the coast, of which the southern is George harbour. The northern, lying at the entrance of Burnaby strait is Tangle cove. It is a well sheltered anchorage for a small vessel, but a shoal, the extent of which is unknown, lies off its mouth. The entrance is between a small island at its south side, and two other little islets to the north. In it lies a rock which uncovers at low water. The mountains at the head of Tangle cove are steep, and probably reach 3,000 feet in height; part of their upper slopes are bare of trees, but apparently covered with moss, where not composed of rock.

**North side.**—On the south shore of Burnaby island is a bay, with several small islands across the mouth of it, which may be a good harbour, but it has not been examined. Further east, in the vicinity of an abandoned copper mine, are Blue Jay and Kingfisher coves.

**Granite point** is a rather remarkable whitish crag, separated from the main shore by a narrow neck of low land.

The **Bolkus islands** form a chain about 2 miles long, lying east and west in the centre of Skincuttle inlet. They are five in number, with many small rocks and reefs; the land is low, and on the western and largest of the islands the soil appears to be good, though now covered with dense forest.

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\* H.M.S. *Hecate*, September 1862, anchored in Skincuttle, in  $9\frac{1}{4}$  fathoms at low water, with east side of Harriet island bearing S.  $27^{\circ}$  E., right extreme of Flat islands N.  $39^{\circ}$  E., and Green islet N.  $89^{\circ}$  E.

**BURNABY STRAIT** is 9 miles in length between Skincuttle inlet and Juan Perez sound, the southern portion for a distance of about 4 miles being narrow, but gaining at the northern end an average width of  $1\frac{1}{2}$  miles. All parts of Burnaby strait must be navigated with great caution as there are many rocks, and a large portion of them are covered at high water.

**Dolomite narrows**, at  $2\frac{1}{2}$  miles north of Skincuttle inlet. The strait here is not more than a quarter of a mile wide, the channel is crooked, and obstructed by rocks and shoals, having from 6 to 8 feet at low tide. The tides, however, are not strong, but it cannot be recommended as a passage for any craft larger than a boat or canoe. Just south of Dolomite narrows, from the west side of the strait, opens Bag harbour, expanding within to a basin nearly a mile in diameter.

**The Twins.**—Nearly abreast of Dolomite narrows, on Burnaby island are two conspicuous mountains estimated at 1,500 feet in height.

**Island bay**, at  $1\frac{1}{2}$  miles North of the narrows, runs westward, and is 2 miles deep. It is named from the number of small islands in it, about 17, and is probably too rocky for a safe harbour.

**Skaat harbour** is a bay  $2\frac{3}{4}$  miles wide, with a depth of about 3 miles. In its mouth lies Wanderer island and several smaller ones. The harbour turns into a narrow inlet in its upper part, and terminates among high mountains forming a portion of the axial chain of the islands. Skaat harbour has not been sounded or carefully examined, but from the character of its shores would be likely to afford good anchorage, especially westward of Wanderer island, and if so, it is the best for large vessels in this vicinity. The harbour will probably be found deepest on the Wanderer island side, as there is an extensive field of kelp off the opposite shore. All Alone stone and Monument rock form good marks to the northern entrance of Burnaby strait, near which lies the mouth of the harbour. The entrance to Skaat harbour on the southern side of Wanderer island is very narrow. At the angle formed between it and the shore of Burnaby strait are two small coves affording anchorage for a small vessel, but with wide tidal flats at their head, which a short distance beyond low-water mark fall away rapidly into deep water.

**Limestone rock** is a dangerous reef, bare only at low water, but not extensive, though a second rock, also only dry at low water, lies a short distance south-east of it. The eastern point of Wanderer island, in line with that of Centre island, leads over Limestone rock, a mile to the southward of the latter.

**Huxley island**, at the northern entrance of Burnaby strait, is nearly 2 miles long north and south, and about  $1\frac{1}{2}$  miles broad; it is bold

and remarkable, rising rapidly from the beach to a height exceeding 1,000 feet. Abreast the north-west point of the island, in mid channel, a cast of 70 fathoms was obtained, with a fine sandy bottom. At 4 miles North of Dolomite narrows, the passage between Huxley island and the north-west end of Burnaby island leads into Burnaby strait.

**Burnaby island.**—The north shore of Burnaby island,  $5\frac{1}{4}$  miles in length N.E. and S.W., is nearly straight on the whole, though with a few shallow bays, one of which is called Section cove.

**Alder island** lies about the centre of this stretch of coast; it is about half a mile in diameter, nearly flat, with probably a good anchorage behind it, which should be approached from the north, as Saw reef runs out from the shore of Burnaby island to the eastward, and this part of the coast is broken and rocky, with large fields of kelp extending off it. The hills on the north side of Burnaby island are estimated at 300 to 500 feet in height.

**Scudder point.**—From Scudder point, the north-east point of Burnaby island, the east side of the island trends southward, allowing the outer of the Copper islands to be seen. A considerable width of low land stretches back from Scudder point, covered with an open growth of large but gnarled spruces. Little beaches of coarse gravel fill the spaces between the low shattered rock masses, apparently caused by the action of a heavy surf. In a cove on the north side is a strongly built but abandoned Indian house. North of Granite point, is a deep bay with a high island lying in the mouth of it.

**JUAN PEREZ SOUND** has at its entrance between the north of Burnaby island and Ramsay island, a width of 8 miles. The sound runs westward, giving off a number of smaller inlets and bays, and is continued in a more northerly direction by Darwin sound, by which it communicates with the upper ends of the long inlets which run westward from Laskeek bay. From the centre of a line joining the outer entrance points to the southern entrance of Darwin sound, Juan Perez sound is  $13\frac{1}{2}$  miles in length. On its south-western side are Werner bay, Hutton inlet, and De la Beche inlet. These terminate in narrow channels or fiords, which run up among the axial mountains of Moresby island, and which have not been examined to their heads. From Werner bay two small inlets branch. Hutton inlet appears to be about 3 miles long; De la Beche nearly 6 miles, with a low valley, hemmed in by hills on either side, running north-westward from its extremity. None of these openings seem to be well adapted for harbours, as the shores are bold and rocky, seldom showing beaches, and the water to all appearances too deep for anchorage.



**Bischoff islands**, lying in the north-west part of Juan Perez sound, off the south side of Lyell island, are low, but densely wooded. There is sheltered anchorage for small craft between the two larger islands, but it must be entered from the westward, and with much caution, owing to the number of rocks and sunken reefs which surround it.

**Sedgwick bay**, about 3 miles deep, in the south shore of Lyell island, is too much exposed for a harbour, as southerly winds draw directly up Juan Perez sound.

**Ramsay, Murchison, and Faraday islands** are the largest of a group of islands forming the north-east side of Juan Perez sound.

Ramsay island is  $2\frac{1}{2}$  miles in length east and west; bold hills rise in the centre of the island, which is densely wooded. Its south shore is high, with some rocky cliffs; two small islets lie off the north-east side, which is rugged and composed of solid rock. The north-west shore has several coves, but none suited for anchorage. Murchison island is  $2\frac{1}{2}$  miles long; and Faraday island nearly 2 miles; both are low.

Between Ramsay and Murchison islands is a little group composed of Hot Spring, House, and a few smaller islets and rocks. On the south side of Hot Spring island is the spring from which it has its name. Its situation is easily recognised by a patch of green mossy sward which can be seen from a considerable distance; steam also generally hovers over it. The temperature is so high that the hand can scarcely bear it with comfort. The water has a slight smell of sulphuretted hydrogen, and a barely perceptible saline taste. The Indians bathe in a natural pool in which the waters of one of the streams collect.

Between Hot Spring and House islands is a good anchorage for small craft, sheltered on all sides but the north.

**Tar islands.**—Running northward from the end of Murchison island is a chain of small islands about 4 miles long named the Tar islands, as the Indians report that on one of them bituminous matter is found, oozing out among the stones on the beach. Agglomerate island, the southernmost has apparently been burnt over, and is covered with standing dead trees. These islands are only approximately placed on the chart. Outside of them lies a single low island with a few trees on it, named Tuft island.

Rocks dry at low water lie between Faraday and Murchison islands, and there are several small rocky islets and low-water rocks in the vicinity of Hot Spring and House islands.

**Entering Juan Perez sound.**—Vessels entering the sound had better do so to the southward of Ramsay island, till the narrower channels

have been surveyed. No bottom was reached with 94 fathoms of line in the centre of the sound south of Ramsay island, nor at about a mile south-east of the extremity of Bischoff islands. The water is apparently deep throughout, but it has not been sounded.

**LYELL ISLAND** is about 15 miles in diameter east and west, and 9 miles north and south. It is separated from Moresby island by Darwin sound. The island is composed of hilly land, generally rising at once from the shores to heights of 600 to 900 feet, and attaining towards the centre of the island a height probably exceeding 1,000 feet. It is densely wooded and on the low land has some fine timber. The east coast has not been surveyed. A-tli inlet, on the north side of Lyell island, has not been examined. It is about 3 miles deep, with two main arms, and does not appear to be a good harbour.

**Halibut bank.**--About 3 to 4 miles E.N.E. from the north-east point of Lyell island is Halibut bank, with 23 fathoms water on it. This is probably the same bank H.M.S. *Alert* got 37 fathoms on.

**DARWIN SOUND** from its southern entrance to White point is 12 miles in length north-west and south-east. It is irregular in width, but is a fine navigable channel. In the south entrance no bottom was found at 94 fathoms. In entering from the southward, Shuttle island looks nearly round. The channel on its eastern side should be followed, as this seems to be quite free from impediments. Abreast the north end of Shuttle island in this channel a cast of 18 fathoms was obtained. A mile beyond this point, and in mid-channel, is a low rock which is not readily seen, with a second bare only at low water a short distance to the north of it.

**Tides.**--The flood sets up Darwin sound from the southward into the various inlets, and then eastward to the open sea again by Richardson and Logan inlets. The ebb in like manner draws through from end to end in the opposite direction. The tidal stream runs at the rate of 2 knots at the strongest.

**Bigsby inlet.**--The south-west side of Darwin sound for 5 miles from the south entrance is rocky and broken, with several coves and inlets. Bigsby inlet then runs in  $2\frac{1}{2}$  miles in a westerly direction. It is a gloomy chasm, scarcely half a mile in width, and surrounded by mountains probably as high as any in the islands. These rise steeply from the water, sometimes attaining in the first instance a height of 3,000 feet, and are in places nearly perpendicular, but are generally well wooded. Further back, especially to the southward and westward, massive summits of bare granite rise to a height of 4,000 to 5,000 feet with their gorges filled with drifted snow fields. The inlet is almost void of anything like a beach.

**Shuttle island**, though low, is rocky. The channel to the west of it is probably deep enough for vessels of any class, but should not be used until surveyed. There is a rock, covered at high water, on the west side of its northern entrance.

**Echo harbour.**—At  $1\frac{1}{2}$  miles northward of Shuttle island, and opposite the inner end of Richardson inlet, is Echo harbour. The passage into the harbour runs southward about a mile, and is surrounded by high hills which towards its head rise to rugged mountains. The outer part of the entrance has a depth of 10 fathoms in it, the sides then approach, leaving a channel scarcely 300 yards wide between abrupt rocky shores. In the harbour proper the depth is everywhere about 15 fathoms, decreasing gradually toward the head for a short distance, and then running steeply up to a flat which is partly dry at low water, and above high-water mark forms a narrow grassy beach. The bottom is soft mud, and excellent holding ground. A very narrow passage leads westward from the bottom of the harbour into a secluded basin, scarcely a quarter of a mile in diameter, which, with the exception of a channel in the middle, is nearly dry at low water. Into its head flows a large brook, coming from the mountains to the south-westward.

**Klun-Kwoi bay.**—At 2 miles west of the entrance to Echo harbour, the shore line falls back in Klun-Kwoi bay. The bay runs up in several arms, which have not been carefully examined, among the bases of rugged snow clad mountains, which rise steeply from the shores, or at the sides of the valleys, by which the heads of the inlets are continued inland. The highest peaks are probably 5,000 feet or more in altitude. The mountains of Moresby island appear to culminate here, and are not such a prominent feature further southward. To this part of the range Perez's name of Sierra de San Christoval may be applied with the greatest propriety. The head of the bay approaches the southern arm of Tasoo harbour on the western side of Moresby island to within a couple of miles.

**Crescent inlet** may be considered as forming the extension of Darwin sound northward. It turns gradually through nearly half a circle, from a north-west bearing to a direction nearly south-west, and is over 4 miles in length. It is a fiord, with steep mountains and wooded sides, but probably not so deep as most similar inlets, as there are stretches of beach of some length. It is not known if the Indians have any trail across to Tasoo harbour, which, if correctly placed, the distance across to it cannot be great. Red top mountain is partly bare and about 3,000 feet high. It is the most conspicuous peak in the vicinity, rising on the north side of the inlet, at the angle of the bend.

**LASKEEK BAY** is the name given to the wide indentation of the coast between the north-east extreme of Lyell island and Vertical point, the south-east point of Louise island, bearing N.W. and S.E. from each other, and 10 miles apart. From Laskeek bay four large inlets run westward; of these the two southern, which have been named Richardson and Logan inlets, open into the head of Darwin sound.

The two northern inlets, Dana and Selwyn, communicate at their heads with the head of Cumshewa inlet to the northward.

**Richardson inlet** is about 11 miles in length in a W.S.W. and E.N.E. direction, with an average breadth of  $1\frac{1}{2}$  miles. The southern side is formed by Lyell island, A-tli inlet being just within the entrance and Dog island about 5 miles within it. The northern side by Kun-ga, Tan-oo, and Inner islands, from east to west. The inlet is straight, with moderately bold shores. Kun-ga island is about 1,500 feet high, and forms a good mark for the entrance; there is a low rocky reef some distance eastward of the outer point of Kun-ga, and a second off the south shore of the same island. Near Dog island there are several small islets and rocks; and at about  $3\frac{1}{2}$  miles west of it, on the south side of the inlet, is a cove, where a small vessel can find a convenient anchorage, probably the nearest stopping place to Laskeek village. The channels between Kun-ga and Tan-oo and the latter and Inner islands are probably deep, though the first should be navigated with caution, and care taken to avoid the east end of Tan-oo island, as several rocks and patches of kelp lie off it.

Laskeek or Klue Indian village is situated on the eastern extremity of Tan-oo island. It is one of the most populous still remaining in the Queen Charlotte islands.\* The village, extending round a rocky point, faces two ways, which prevents its being wholly seen from any one point of view. The western end of Richardson inlet is contracted to a width of about a quarter of a mile, and obstructed by a small island and several rocks.

**The Tide** runs through this passage with considerable strength, and it is unsuited as an approach to Echo harbour, though the most direct way in from the sea.

**Logan Inlet** is about 7 miles in length, and nearly parallel to Richardson inlet, with Flower Pot island, a small bold rock, covered with

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\* H.M.S. *Alert* anchored off this village in 11 fathoms, about 2 cables east of the village. This anchorage is not a good one, being exposed to the N.W. and S.E. winds, and is steep close-to. On anchoring, the houses should not be brought to the south of west, as patches of rock stretch out two-thirds the distance across to the opposite shore from Laskeek point, so that going or coming from the north the east shore should be kept well on board, being steep-to and quite safe. In the season, kelp marks the patches.—Navigating-Lieutenant A. F. Boxer, 1860.

trees, in its mouth. One other small island lies close to the shore on its southern side, but it is otherwise free from obstructions, and constitutes a fine navigable channel, and the best approach to Echo harbour.

Vessels should enter to the north of Flower Pot island, and keep in the centre of the channel. Kun-ga island, as already mentioned, is high. Ti-tul island, small and with low limestone cliffs, lies northward of it. Tan-oo and Inner islands are also bold, rising to rounded hills of nearly uniform height of about 800 feet. They have some good gravelly beaches, though generally rocky.

**Timber.**—In the inlets in the vicinity of Lyell island there is a considerable quantity of fine timber, trees of great stature growing in all moderately level and sheltered places.

**Dana inlet** runs about S.W. by W. nearly 8 miles, with bold shores. In the mouth of the inlet is Helmet island, small, rocky, high, and of rounded form. A second small island is near it, and from most points of view the channel between the two is not seen. Care is necessary not to mistake this island for Flower Pot island, in the mouth of Logan inlet. At its western extremity Dana inlet turns northward, communicating by a narrow but apparently deep passage with Selwyn inlet, and thus cutting off Tal-un-kwan island from Moresby island.

**Tal-un-kwan** island is 8 miles long, and 2 miles broad; the hills are rounded in form and from 800 to 900 feet high.

**Selwyn inlet** is nearly parallel to Dana inlet and about 10 miles in length, and near its head, turning northward, runs in that direction for a like distance, forming at high water a passage for canoes into the upper part of Cumshewa inlet, and separates Louise island from the main shore. The passage is narrow and walled in at both sides by mountains which rise very steeply from it. Entrance island is small and lies off the north entrance point, with a low rock about a mile eastward of it. With the exception of a small rock about the middle of Tal-un-kwan islet and near the south shore, the inlet appears to be free from dangers.

After giving the islets off the north entrance a wide berth, a vessel should keep the north shore for a distance of 5 miles until the entrance of Rock-fish harbour is reached.

**Rock-fish harbour\*** is formed by a boot-shaped projection of low land, at the angle of Selwyn inlet. The harbour runs in a W.S.W. direction for about  $1\frac{1}{2}$  miles, with a width of half a mile, and an average depth of 15 fathoms. It is a secure and well sheltered anchorage, more easily entered than Cumshewa.

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\* See Admiralty plans of Selwyn inlet; Ports in Queen Charlotte islands, No. 2,168.

The head of the west branch of Selwyn inlet cannot be more than 9 or 10 miles from Mitchell or Gold harbour of the west coast. A low valley runs some distance westward. At about 3 miles from the entrance of the passage leading to Cumshewa is the opening to an inlet about 3 miles deep in a south-west direction, approaching to within  $4\frac{1}{2}$  miles of Mitchell harbour. These upper arms of Selwyn inlet are environed by high and rugged mountains.

**Reef and Low islands** are situated in the outer part of Laskeek bay. The southern and first named is steep along the water's edge, and a reef runs off about half a mile to the southward of it. Their exact position is not known.

**LOUISE ISLAND** is about 15 miles long east and west, and 8 miles broad. The mountains are high, and doubtless the snow on them lasts throughout the summer. From Selwyn inlet the east coast of the island runs north-eastward 8 miles, with several small bays, fully open to the sea, and generally rocky.

**Vertical point**, the northern entrance point of Laskeek bay, projects at about half way along this stretch of shore, and is remarkable from the shape of the beds of grey limestone of which it is composed, aggregating at least 400 feet in thickness. North of the point are the two small Limestone islands, behind which the tide, running southward along the coast, forms a race on the ebb.

**Skedans bay**, about 2 miles from the entrance to Cumshewa, is strewn with sunken rocks and fully open, and should on no account be entered by vessels. A large stream enters its head, which can be seen at some distance inland forming a high waterfall, and which, according to the Indians, flows out of a lake of some size high among the mountains. Skedans village forms a semi-circle round the head of a small bay or cove, very rocky, which indents the south side of a narrow isthmus, connecting two remarkable nipple-shaped hills with the main shore. This peninsula is situated at the south entrance point to Cumshewa inlet, and between it and the Skedans islands, the tide forms a race. The islands are low and tree clad.\*

**CUMSHEWA INLET†** is a long inlet running about 15 miles westward, with a prolongation southward connecting it with Selwyn inlet. It differs in the low character of the land on its northern shore from the inlets to the south, and marks the junction, on the east coast of the islands, of the mountain region and flat country. There is more beach along the shores than in the southern inlets, and wide tide flats, indicating shoaler

\* H.M.S. *Alert* when on her passage from Laskeek village to Cumshewa inlet passed inside the islands to the northward.—Navigating Lieutenant A. F. Boxer.

† See Admiralty plans; Ports in Queen Charlotte islands, No. 2,168.

water, which is not only found in the inlet itself, but extends off the coast. Towards the head of the inlet, the shores are quite bold in some places, and the water probably deep.

In the mouth of Cumshewa inlet, to the north of Skedans islands are 20 fathoms water, with a shell and gravel bottom. Off the north point of entrance, Cumshewa island, a small barren rock, and the Cumshewa rocks, extend in a south-easterly direction nearly  $1\frac{1}{2}$  miles. A vessel coming from the north should, therefore, keep well off the shore till the rocks are passed, and then stand in to the entrance in a north-westerly direction. On the outer point near Cumshewa island are the ruins of an abandoned village. Kin-gui island, just within the north entrance point, on the north side of the inlet, is covered with dead trees, and can be recognised easily. At about a mile within the entrance, an extensive shoal, on which the sea breaks heavily, runs off from the south shore, leaving a channel about half a mile wide between it and the north shore of the inlet. The passage in is through this channel, in which it is reported there are 7 and 8 fathoms water. The southern point of a peninsula which projects from the northern shore of the inlet, bearing S.  $88^{\circ}$  W., just clears the northern edge of the shoal. A few patches of the shoal dry at low water, but the greater part is indicated only by the kelp which grows thickly on it during the summer. The tides run strongly in the mouth of the inlet.

**McKay cove.**—Within the narrows, on the north shore, is a cove, where a small house for the purpose of trade was built, but is now abandoned. The shore dries out for some distance at low water, but off them a small vessel may find a pretty secure anchorage, though the tide sweeps round the cove.

**Cumshewa village** is also situated on the north side of the inlet, about one mile westward of McKay cove, the houses being built along the shore of a bay facing south-eastward,  $3\frac{1}{2}$  miles within the entrance. A small rocky islet, connected with the main at low water, lies off it.

**Anchorage.**—The best anchorage for a large vessel is probably to be found on the south side, nearly opposite the peninsula before alluded to, and abreast a stretch of low land, eastward of a stream.

**The COAST.**—From the entrance to Cumshewa inlet, the coast runs north-westward to Spit point, the south point of Skidegate inlet, a distance of 17 miles. It is indented by two considerable bays, Copper bay—the northern—about 5 miles from Spit point, received its name from some copper works carried on here at one time. The land is low, and very different in appearance from that of the coast southward. The projecting

points are generally low and flat, and formed of gravel deposits.\* With the change in the character of the land, the beach becomes flat, and shoal water extends far off shore, the depths shoaling from 10 fathoms at 3 miles off Cumshewa island, to 6 and 7 fathoms at 7 miles off Spit point. Near Cumshewa the beaches are almost entirely composed of boulders, but show more gravel and sand toward Skidegate. The surface of the country is densely wooded with trees of large size.

**SKIDEGATE† INLET and CHANNEL** separates Moresby from Graham island. The harbour is spacious, and communicates with the Pacific at Buck point, south of Cartwright sound, by an intricate channel, only navigable for canoes a portion of the way. Skidegate inlet runs in a south-westerly direction for about 9 miles from the Bar rocks, where it contracts to a width of  $1\frac{1}{2}$  miles between Image point and that on the north side of Alliford bay. Within these points it opens again, forming two expansions, separated by Maude island. The part of the northern expansion eastward of Lina island forms Bear Skin bay; the part westward of the island has several islands in it, with Anchor cove in the western end; beyond Anchor cove it turns north-west, forming Long Arm. The total length of the inlet from Bar rocks to the head of Long Arm being about 21 miles. The southern expansion forms South bay, in which is South island, its western side passing into Skidegate channel and thence to the Pacific.

The shores of Skidegate inlet are not so bold as those of the fiords to the south, and are generally fringed with a beach of greater or less width. The surrounding country is densely wooded, and where the land is flat, timber of magnificent growth is found. This inlet would be convenient in many respects as a site for saw-mills.

**Spit point** is low and woody, and composed of sand deposits, which, extending northward, form the bar which stretches across the entrance to Skidegate inlet.

**The bar** or spit with from one to 3 fathoms water on it, extends in a north-westerly direction for about  $9\frac{1}{4}$  miles, to within nearly  $1\frac{1}{2}$  miles of Lawn point, the northern point of entrance. The spit slopes off very gradually seaward, while toward the inlet it rapidly deepens to 20 or 30 fathoms.

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\* Cape Chrousteheff, 2 miles to the southward of Spit point, should not be passed nearer than 5 miles; the cape is low and dark-looking. Coming from the southward, it shows very conspicuous; when abreast of it, Spit point, the low south point of Skidegate, becomes visible.—Navigating Lieutenant A. F. Boxer, H.M.S. *Alert*.

† See Admiralty plan of Skidegate inlet, No. 48; scale,  $m = 1 \cdot 0$  inch.



**Bar rocks**, on the outer edge of the spit and  $2\frac{1}{2}$  miles from its extremity, are two in number; the western one dries 5 feet, and lies N.W.  $\frac{3}{4}$  N.,  $6\frac{1}{2}$  miles from Spit point; the outer or eastern rock dries one foot at low water, and bears N.W. by N. the same distance from Spit point; N.E. by E., 4 cables from the inner rock; and 3 miles N.E.  $\frac{3}{4}$  E. from Dead Tree point. The sea does not always break on these rocks. Lawn point, bearing W.  $\frac{3}{4}$  N., leads to the northward of Bar rocks.

**Lawn point** is generally green, with a small sand cliff and a large boulder in front of it; a hill 500 feet high rises immediately to the westward of the point. The coast southward of Lawn point is flat for 10 miles to Village bay, and is covered with standing dead trees.

**Dead Tree point**,  $3\frac{1}{2}$  miles to the southward of Lawn point, is a projecting part of the coast, but otherwise is not conspicuous.

**Village islands**, in front of Village bay, form good marks for Skidegate inlet; the northern one (Bare islet), 125 feet high, is almost bare, and the other (Tree islet), having trees upon it, is 153 feet high.

The village of Skidegate, nearly half a mile in length, is situated in the bay, off which are the Village islands, and consists of many houses, with the usual carved posts, fronting the beach.

**Village bay** is a good stopping place; anchorage may be taken up between Base islet and the beach in 14 fathoms. It is, however, exposed to S.E. winds. Should one of these gales spring up, good shelter will be found in Alliford bay.

**Image point.**—In the cove at Image point some rude buildings have been erected in connexion with the dog-fish fishery, and in 1878 some persons were engaged in it. The trees in the vicinity are chiefly Menzies spruce, yielding a white wood of moderately fine grain.

**Alliford bay**, on the south side of the entrance, is an excellent anchorage, with good holding ground, in about 9 fathoms. The passage between Flowery islet and the North point of the bay, should not be used. Wood and water may be obtained.

**Anchor cove**, situated  $10\frac{1}{2}$  miles from Village islands on the north side of the inlet, affords anchorage in 5 fathoms. This is the place of export for the anthracite coal, found on both shores of the inlet, but principally on the sides of mount Seymour, one mile to the northward of the cove. The coal has been mined, a small railway being laid to Anchor cove.\*

**Observation Spot**, on North point, Anchor cove was determined by the Admiralty Survey in 1866, to be in lat.  $53^{\circ} 12' 31''$  N., long.  $132^{\circ} 14' 9''$  W., depending upon Shell island, Beaver harbour, being in  $127^{\circ} 25' 7''$  W.

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\* Cowgitz coal mine, the principal openings have been at a distance of about a mile in a N.N.E. direction from Anchor cove. The Queen Charlotte Coal Mining Company was formed in 1865 to open up the deposits of anthracite which had been discovered here, and abandoned in 1872. In 1869 about 800 tons of coal were extracted, and a portion of it shipped to Victoria.

Slate Chuck brook is the largest stream in Skidegate inlet, its mouth being about a mile north of Anchor cove. The brook receives its name from a quarry a few miles up its course, where the Indians obtain the dark shaly material from which they make carvings. In former years communication used to be kept up with the head of Masset inlet to the north by means of this stream, part of the distance being accomplished in canoe and part on foot.

**Leading island**,  $3\frac{1}{2}$  miles southward of the bare Village island, forms the western part of Alliford bay at the southern entrance to Skidegate inlet; it is 400 feet high and appears round.

**Maude island** lies at the junction of the north and south expansions of the inlet; the island is nearly 4 miles long, S.W. and N.E. and  $1\frac{1}{2}$  miles broad, and 1,260 feet high. On the west end of the island the Indians belonging to Gold harbour on the west coast have established a village, on ground purchased from the Skidegate Indians. The Gold harbour Indians still preserve their rights over that region, and live there much of the summer, but find it more convenient to have their permanent houses near Skidegate.

**Skidegate channel** runs from South bay for 15 miles to the Pacific. From South bay to Log point, a distance of  $8\frac{1}{2}$  miles, the channel is contracted, particularly in the East and West narrows, the former in one part being only 200 feet wide, and the latter 2 cables. The tides from east and west meet about the East narrows, running through the channel with great strength, probably 5 knots in several places. The narrows must be passed at slack water of high tide, which lasts for a very short time, so that both narrows cannot be got through in one tide.

**DIRECTIONS.**—A deep channel into Skidegate inlet may be found northward of Bar rock spit by steering for Lawn point on a S.W. bearing until within about a mile of the point, when the water will deepen to 15 or 20 fathoms; from this point a general S.S.E. course may be steered, paying great attention to the soundings, until the west side of Leading island comes in line with the east side of Bare island.

Navigating Lieutenant A. W. Miller, H.M.S. *Amethyst*, in August, 1876, remarks, "From the north-eastward Lawn point makes like a bluff sloping towards the north. Large ships should bring Lawn point to bear S.W. and steer for it; the water will gradually shoal from 10 and 12 fathoms at 4 miles off, to 5 and  $4\frac{1}{2}$  fathoms at about a mile from the point, when it suddenly deepens to 12 and 20 fathoms. From this position, Welcome point, which appears as a low and grassy patch under Table mountain (but is difficult to distinguish), should bear S. by E.  $\frac{3}{4}$  E. If it does not, bring it on that bearing and exactly in one with the left tangent of the highest part of Table mountain. This will lead in be-

“ tween the Bar rock spit and the shoal extending from Lawn point to “ Dead Tree point, and up to the leading marks.” This course will lead very close to the north-west point of the Bar rock spit, if not over the extremity of it in 3 fathoms at low water. The deep portion of the channel from opposite Lawn point till past the north-west point of Bar rock spit or the Boulder at Lawn point bears W. by N., is only one-third of a mile wide, attention to the lead and steering, with a sharp look out, is therefore necessary, for ‘as previously remarked Welcome point is not readily distinguished.

The west side of Leading island, in line with the east side of Bare Village island bearing South, leads over the Bar rock spit, to the northward of the rocks, in 15 feet at low water, from whence the depth is from 20 to 30 fathoms to Village islands; passing to the southward of these islands anchorage may be found in the north-east side of Bear Skin bay in 12 fathoms, or to gain shelter from a south-east gale, Alliford bay is recommended.

Coasting vessels with local knowledge use a passage with  $3\frac{1}{2}$  fathoms over the spit, ‘about one mile south of the Bar rocks (when they are visible), by keeping Dead Tree point bearing W.S.W. until the leading mark comes on.

Approaching Skidegate inlet the water should not be shoaled under 6 fathoms at low water until Lawn point bears S.W. or the leading marks are on.

**TIDES.**—It is high water at full and change at Skidegate inlet at 1 h.; springs rise 17, neaps 14 feet.

**The COAST.**—From Lawn hill, near Lawn point at the entrance of Skidegate, to Rose point, the north-east extreme of Graham island, the distance is about 48 miles. The coast line is straight and open, with no harbour, and scarcely a creek or protected cove for canoes or boats for long distances. The beach is gravelly and sometimes stony to the Tl-ell river. Beyond this it is generally sandy to Rose point. For many miles northward cliffs of clay and sand are found alongshore, and for about 17 miles northward of Tl-ell river these frequently rise into cliffs 50 to 100 feet in height. North of the range of cliffs the shore is almost everywhere bordered by sand-hills, which are covered with coarse grass, beach pea, &c., and would afford fine grazing for cattle. Behind these are woods, in some places burnt, and the trees generally scrubby. This part of the coast is also characterised by lagoons, and is evidently extending seaward, by the banking up of the sand under the action of the sea. The largest lagoon opens out at cape Fife about 6 miles to the southward of Rose point, running southward for some miles, and reported by the Indians to communicate with a second further inland. The mouth of this lagoon forms a safe harbour for boats or canoes at high water, but is nearly dry at low water.

The coast between Skidegate and Rose point having dangerous flats extending off it, which have not been examined, should be given a berth of 6 or 7 miles, and the lead kept constantly going whilst running along it, the soundings varying from 9 to 11 fathoms.

**Ti-ell river** enters the sea at  $10\frac{1}{2}$  miles north of Lawn point. It is a stream of some size. For about 3 miles above its mouth it runs nearly parallel to the shore, and separated by a low swampy strip of land about half a mile in breadth from the sea. This land is of comparatively modern formation, being composed of sand and gravel. It is partly covered with spruce trees of no great size. A ruined Indian house stands about 3 miles south of the mouth of the river. The water of the river is of a dark coffee or amber colour.

**Cape Ball** (Kul-tow-sis) nearly 20 miles from Skidegate bar, is very conspicuous, having a remarkable white cliff on it, with lower cliffs on either side; it cannot be mistaken. The Indians report that at very low tides patches of clay dry a long way off the cape. In the bay North of cape Ball are the remains of an Indian village.

**Rock.**—Captain McNeill, of the Hudson Bay Company's Service, found a rock with 2 fathoms on it, lying East about 6 miles from cape Ball.

**Cape Fife.**—Near this cape on some parts of the shore magnetic iron sand is abundant, with numerous colours of gold in it. There is anchorage off the cape with off-shore winds; in this neighbourhood the lead must be most carefully attended to.

**ROSE POINT** was named by Douglas in 1788, but is known to the Haida Indians as Nai-Koon, or long nose. It is a remarkable low promontory, apparently formed by the meeting of the currents and waves from the southward and westward round this corner of the island. The inner part of Rose point, near cape Fife, does not differ from the low wooded coast to the south; the Indians say there are inland many lakes and swamps. Further out, where the point is narrower and more exposed, it is clothed with small stunted woods, which in turn give place to waving grass-covered sand-hills. Beyond this the narrow gravelly point is covered above high-water mark with heaps of drifting sand, and great quantities of bleached timber, logs, and stumps, piled promiscuously together. The apex of the point is a narrow steep-sided gravelly bank, which extends for a long distance at low water.

A dangerous spit runs off Rose point in a north-easterly direction, and is reported to extend for a distance of nearly 5 miles, but its exact extent has not been ascertained. The point should, therefore, especially in dark or thick weather, be given a wide berth. Several vessels have

been lost on this point. It is a dangerous and treacherous point to round at any time, except in fine clear weather, and many Indians have been drowned there on different occasions.

**HECATE STRAIT.—Soundings.**—In the fairway of the south-east part of Hecate strait the water is deep. From Skidegate across to within 10 miles of the mainland, in a north-east direction, the depths are from 8 to 25 fathoms; in some cases, growing kelp was passed through by the surveying vessel *Beaver* (1866) in 8 and 13 fathoms.

**Shoal.**—In lat.  $53^{\circ} 26' N.$ , long.  $131^{\circ} 6' W.$ , approximate, a shoal has been reported, but its position is doubtful.

The northern part of the strait between Rose spit and Stephens island, is nearly 30 miles wide. With the centre of Zayas island bearing N. by W.  $\frac{1}{2}$  W., and the north extreme of Stephens island E. by N.  $\frac{3}{4}$  N., the depth is 15 fathoms. This bank of soundings was found very useful on one occasion, during a strong breeze from the south-east, with thick weather, when H.M.S. *Virago* anchored on it and remained until it cleared up, and the land became visible.

Northward of a line drawn from Skineuttle inlet, across the strait to Banks island, the depth does not exceed 100 fathoms, and is generally much less. A similar shallow area borders Graham island to the north, and it is also probably comparatively shallow for some distance off the west coast of the northern part of the same island.

**Tides.**—In Hecate strait, the flood tide comes from the southward. In Dixon entrance, the flood coming from the westward round North island, sets along the Masset shore, across Hecate strait for Brown passage, spreading for about 15 miles round Rose point, towards cape Ibbetson, (Edyo passage), where it meets the flood from the southward; consequently between Rose point, cape Ball, cape Ibbetson, and thence south-east 15 or 20 miles, the tides are irregular.

The course and rate of the tidal streams are not regular, being greatly influenced by the winds. At full and change they run with great strength. Time of high water over the strait generally is about 0h. 30m.

Between cape Murray, Percy point, and Zayas island the tides are the strongest and most irregular, causing a heavy and confused sea, so much so, that in bad weather it has the appearance of breakers.

**ROSE POINT to MASSET SOUND.**—The shore between these two places forms a bay 22 miles in width. With the exception of a few small rocky points, the beach is smooth and regular, and almost altogether composed of sand, with gravel in some places, its slope above the ordinary high-water mark being steep. Low sand-hills generally form a border to the woods which densely cover the land. The water is shoal far off

the shore, especially at 15 miles from Rose point, and on approaching Masset sound, where kelp forms wide fields at a great distance from the beach. In the north-east part of the bay there is anchorage with off-shore winds.

**Hi-ellen river** at 9 miles south-westward from Rose point is a stream of some size, which is frequented by great numbers of salmon in the autumn. Its mouth forms a good boat harbour. On its east bank are the ruins of an Indian village, and on its west, Tow hill, an eminence remarkable in this low country, facing the sea with a steep cliff 200 feet high, composed of columnar volcanic rocks on one side, while the other slopes more gradually.

**MASSET HARBOUR** is rather more than 22 miles S.W.  $\frac{1}{4}$  S. from Rose point, and should be approached by vessels with caution; the entrance is between a low point with a ledge of rocks covered with kelp, half a mile off it on the western side, and the point of a long spit partly dry (the surf usually breaking the whole length of it), on the eastern, the passage between having an extensive bar. With the outer western point bearing W. by N. one mile, the depth is 5 fathoms at low water; from this position the course in is about S. b. E.  $\frac{1}{2}$  E., the soundings over the bar varying from 5 to 3 fathoms, for about 3 miles, to abreast a village on the western shore, a little more than a mile from what may be termed the inner or proper entrance to the harbour; the water then suddenly deepens to 9 and 11 fathoms, the channel lying in the direction of the eastern point of what has been called the inner entrance, and the depth, at about 2 cables from the beach that forms it, being from 10 to 13 fathoms. Just inside, and round this point, is a pretty bay, with a beach, containing the principal village (Ut-te was), off the centre of which there is anchorage in 10 fathoms.\* At this part the width of the harbour is nearly 2 miles, a large sand-bank filling up its western side. The ebb tide runs very strong, making this by no means a good anchorage.

In 1878 the Hudson Bay Company had a post at Ut-te was, the only one on the islands; the Church Missionary Society also had a station here which had been established two years. About a mile south of this place, also on the east shore, is a second village, and on the opposite side a third. They are all decaying, and have comparatively few inhabitants. Masset must at one time have been a populous place.

The land in the vicinity of Masset harbour is all low, no hills being visible.† It is generally densely timbered with fine spruce trees, but there

\* See Admiralty plans, Ports in Queen Charlotte islands, No. 2,168. In 1852 the Indians belonging to this place seized, plundered, and burnt an American schooner, the master and crew being spared through the influence of the chief, Edensaw.

† The Hudson Bay Company's cattle have kept themselves, grazing on the open sand-hills in the vicinity of the coast, requiring no attention, summer or winter.

are reports of prairies in the interior, which may not improbably be swamps. At 3 miles up the sound, a lagoon or arm runs off on the east side. At this place the land attains an elevation of 100 feet or more, spreading back in a flat or gently undulating plain at this level. Nearly opposite this place, on the west side is Maust island, which appears to have given its name to the entire inlet. It lies across a bay, which seems at first sight to offer better anchorage than that already referred to. The island is low and sandy, and a great part of the bay or passage behind it is dry at low water.

**Masset sound.**—The length of Masset sound from its seaward entrance to the point at which it expands to Masset inlet, is 19 miles. It is about a mile in average width, and though slightly tortuous, preserves nearly the parallelism of its sides. The depth, ascertained in a few places, varies from 10 to 12 fathoms. A number of little streams enter at the sides, most of which, according to Indian reports, have their sources in small lakes. On the eastern side, at  $4\frac{1}{2}$  miles from the southern or inner end of the sound, where its trend is nearly south-west and north-east, a narrow passage runs off southward, joining the expanded portion of Masset inlet, and forming a large island, which is generally lower than the surrounding country. This passage is partly dry at low water, and is occasionally used by the Indians in canoes.

At its southern end, the narrow part of the inlet, which has been called the sound, expands suddenly to a great sheet of water, 17 miles in length east and west, and in its broadest part  $5\frac{1}{2}$  miles. This, to the northward and eastward is bounded by continuous low wooded land; and to the west and south by hills, rising to mountains, rounded in form and about 1,500 feet high, in the distance.\* The northern and southern shores are of even contour, and often bordered by wide shoals covered with boulders. The western half of the inlet is studded with islands, and it is rather irregular in outline, forming four large bays or inlets with intervening mountainous points. The shores here are steep, with narrow boulder beaches sloping down at once into deep water. About the heads of the inlets, and near the mouths of streams only, are small areas of flat ground found. Of these inlets, that which reaches furthest southward is called by the Indians Tin-in-ow-e.

**Tsoo-skatli.**—On the south side of Masset inlet, 5 miles from its eastern extremity, is a narrow passage, the mouth of which is partly blocked by islands, but which leads into a second great inlet known by the Indians as Tsoo-skatli, or "the belly of the rapid." The largest of the islands in

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\* The natives in 1853 stated that several years ago ships (some having three masts) used to anchor here; and that in August halibut and salmon fill the whole place, while ducks and geese fill the air.

this passage is named Slip-a-ti-a. Kelp grows abundantly in the channel on both sides of the islands, which therefore cannot be very deep. The tide runs through them with great velocity, especially at ebb, when in the western channel it forms a true rapid, with much white water.

Tsoo-skatli is  $9\frac{1}{2}$  miles in length, and from one to 2 miles in width. Its eastern side is formed of low land, while its south-western extremity is a long fiord-like inlet. In this inlet are many islands, the largest, Haq-Keious, is nearly a mile in diameter and about 200 feet high. The eastern portion of the south shore is rocky, with many small islets off it. On the eastern side of Tsoo-skatli,  $2\frac{1}{2}$  miles from its extremity, is Tow-us-tas-in, a remarkable hill with a steep cliff on one side. The north-eastern part of Tsoo-skatli has a depth of from 10 to 16 fathoms. The depth of the north-western part, about the centre between the large island and the mainland, was 23 fathoms in one place. That of the south-western arm is probably greater.

Many streams flow into these inlets, the largest is probably that which is known as Ya-koun, and enters the south-eastern corner of Masset inlet, in the bottom of a shoal bay. About the mouth of the Ya-koun are large sandy flats, dry at low water. It was formerly navigable for small canoes a long way up, and is reported to head in a large lake. This is the stream mentioned as forming a portion of the disused route from Masset to Skidegate.\* On the west side of the bay at the mouth of this river are a few small houses, used during the salmon season.

The Ma-min river joins the Tsoo-skaiti inlet at its east end, and has a wide delta flat about its mouth. It is navigable by small canoes for several miles, but is much obstructed by logs. The Awun river, some miles west of the entrance to Tsoo-skaiti, may not be large; it is said to rise in a lake. Ain river, entering Masset inlet from the north-west, is an important stream. There are several Indian houses which are occupied in the summer above its mouth. It is said to flow out of a very large fresh water lake of the same name, the river itself being short. The lake is filled with islands, and in the winter is frozen completely over.

**TIDES.**—The rise of the spring tide at the entrance of Masset sound was estimated at about 14 feet, but owing to the length of the narrow sound, Masset inlet has a tide of from 8 to 10 feet only; and the second or Tsoo-skatli still less, about 6 feet. On one occasion, it was high water at the entrance of Masset sound at 1h. 15m. p.m., while in the narrow entrance

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\* According to Indian account the distance to be traversed on foot, after proceeding up the river as far as possible, is about half a day's journey, across a mountainous neck of land, from the summit of which both harbours can be seen.



to Taoo-skatti,  $23\frac{1}{2}$  miles distant, the flood had just caused a reversal of the current at 6h. 20m.

**MASSET to VIRAGO SOUND.**—The coast between these two places is everywhere low and wooded, with occasional open grassy spaces. It differs from the coast east of Masset, in being rocky or covered with boulders. No wide sandy bays occur, and the points are generally of dark low rocks.

The water is shoal far off shore, with wide fields of kelp. The shore should be approached with caution, with the lead constantly going.

In a N.N.E.  $\frac{1}{2}$  E. direction from the east point of Virago sound, there are soundings for several miles; at 8 miles the depth was 52 fathoms, sand; at 5 miles off, the soundings were about the same; at 2 miles there were 28 fathoms, sand, and the water then gradually shoaled in to the shore. In July, 1853, great quantities of drift kelp were passed through.

**Anchorage.**—Between Masset harbour and Virago sound, which lies about 10 miles to the westward, there are some good anchorages, in which a vessel might remain a night instead of keeping underway, or cruising about with a south-east wind, and thick weather.

**VIRAGO SOUND**, constituting the entrance to Naden harbour, is  $3\frac{1}{2}$  miles wide between its outer points, capes Edensaw to the east and Naden to the west; and  $2\frac{1}{2}$  miles deep to the narrow passage, which is  $1\frac{1}{2}$  miles long and about half a mile wide, leading into the harbour.

The outer anchorage of Virago sound is sheltered from all winds to the southward of East and West. With two small wooded islets on the west side of the entrance, bearing W.  $\frac{1}{2}$  S. one mile, the east point N.E.  $\frac{3}{4}$  E. 2 miles, and the opening to the inner harbour S.  $\frac{3}{4}$  W. about 2 miles, the depth is 5 fathoms water, sand and shells; the shores are low and fringed with kelp, but the lead will be a safe guide, as the water shoals gradually towards the land.

A vessel can always get a pilot by firing a gun and anchoring for a short time, which I should recommend being done. The Indian fishermen will come off and point out any danger that may be in the way for a small recompense.\*

The inner anchorage, opposite Kung village on the western side, just within the narrows, is in 10 fathoms, at about 2 or 3 cables off shore. This village has been nearly abandoned for the new Ya tza village on the

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\* Navigating Lieutenant A. F. Boxer, H.M.S. *Alert*, 1860.

See sketch of Virago sound, on Admiralty plans of ports, &c. in Queen Charlotte islands, No. 2,168.

coast at about  $4\frac{1}{2}$  miles north-west of Virago sound. This site, though difficult to land at with northerly winds, has been chosen because the Indians can get more trade here, as many Indians come across from the north, a distance of about 40 miles, and there is a rather prominent hill behind Klas-Kwun point by which the canoe-men doubtless shape their course. The people were removing in 1870. Above Kung village a bank extends off the eastern side of the narrows nearly half-way across, leaving a channel along the western shore, with 7 to 10 fathoms water in it.

**NADEN HARBOUR.**—This capacious and land-locked harbour is about 4 miles in greatest length north and south, and 2 miles in width, with depths of 8 to 12 fathoms in it. Low land, densely wooded with spruce and hemlock of fine growth, borders the whole harbour. Rock appears on the shore only near the bottom of the harbour, and at Kung village in the narrows. The south-eastern shore of the harbour is low, with wide tide-flats; the north-western comparatively bold.

**Naden river** enters the harbour at its south-east corner, and is probably the largest river on Queen Charlotte islands. It flows from a large lake, which, according to Indian account, must be 10 miles or more in diameter. The river is much encumbered by fallen trees, and its banks, except in a few swampy flats, are densely wooded. At high water a boat can proceed about 2 miles up. Stanley (To-ka) river in the south-west corner of the harbour is reported to be navigable for boats. Several smaller streams also enter the harbour. The spruce timber is excellent, and the harbour is well adapted for saw mills and the export of lumber. In August, the Indians say that halibut and salmon are abundant, and geese and ducks come in large flocks.

**Tides.**—The rise and fall is about 13 feet.

**VIRAGO SOUND to CAPE KNOX.**—From cape Naden, on the west side of Virago sound, the general trend of the shore is westward for about 17 miles to cape Knox, the north-western extreme of Graham island. The shore and country behind it are generally low, though with some rocky cliffs of no great height. The points are rocky; but wide gravelly or sandy bays intervene. Some rocks occur at a little distance off shore, but there is no appearance of a wide shoal belt like that found east of Masset. Klas-Kwun point  $4\frac{1}{2}$  miles W. by N. from cape Naden, is a remarkable promontory, rising in the centre to a hill about 200 feet in height, which, owing to the flat character of other parts of the shore, is visible for a long distance. In a rocky bay to the east of the point, and open to the north-eastward, is Ya-tza village before described.

**Jal-un river.**—Half-way from Klas-Kwun point to the east entrance of Parry passage is Jal-un river. This stream is of no great size, but its mouth, in the bottom of a little bay, forms an excellent canoe or boat harbour at high water, and appears to be a favourite stopping place for travelling Indians. At 3 miles further westward is a small promontory, on the east side of which is another excellent boat harbour.

**Pillar bay.**—To the west is a wide bay, called Pillar bay from a very remarkable columnar mass of sandstone and conglomerate rock which stands near the eastern side, about 25 feet in diameter and 95 feet high. The summit is sloping and covered with some small bushes. It is separated at high water from the main shore, but rises from a sandy and stony flat at low water. The Indian (Haida) name is Hla-tad-zo-wöh.

**PARRY PASSAGE** separates North island (which forms the north-western extremity of Queen Charlotte islands) from Graham island. The passage proper is about 2 miles in length, with an average width of three-quarters of a mile. This channel between the ledges of rock which extend off the southern side for about a mile and North island is clear, but the tide rushes through it, forming a race. The flood runs eastward, leaving the east end of the passage with a north-easterly direction. Two deserted Indian villages (Kak-oh and Kioo-sta) lie on the south side of Parry passage, near its west entrance.

**Bruin bay.\***—Just without the eastern entrance of Parry passage, and on the south side, abreast of Lucy island, is a bay with anchorage in it, in from 12 to 14 fathoms, sand. A line of kelp fringes the shore, which is studded with rocky patches and stones. This is not a good anchorage except for a temporary stopping place during thick weather, as the flood sets into it from the passage, forming a number of eddies, and rendering it difficult to lie at single anchor without fouling it. The country at the back is low and covered with trees, with here and there grassy spots.

**North island**, named by Dixon in 1787, is about 5 miles in length, between North point and its southern extreme, and composed of low land, no point probably reaching a height of 300 feet. It is densely wooded. On the eastern side of North island there is said to be a good anchorage in a bay which was formerly often used by the vessels belonging to the old North West Company.

Cloak bay forms the western entrance to Parry passage lying between the south-west shore of North island and cape Knox. It is about 2½ miles

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\* This place received its name from a large bear coming down on the beach to feed abreast of the ship, while H.M.S. *Virago* was at anchor, in May 1853.

wide, with a similar depth. Some rocks on which the sea breaks only in heavy weather lie some distance off the North island shore, and there are also a couple of remarkable pointed islands on this side.

**Henslung.**—On the south side of North island, in Parry passage, is a snug cove named Henslung, in which whalers used occasionally to anchor. H.M.S. *Virago* anchored in it in 30 fathoms water, and had but just room to swing clear of the precipitous rocks of conglomerate which form its western side. At the head of the cove is a sandy beach, with a stream of water running through it.

**Tides.**—Time of high water at full and change at Henslung is given by Mr. William Douglas commanding the trading ship *Iphigenia* in June 1788, as 0 h. 20 m., and the rise 16 feet. The night tides were 2 feet higher than the day.

**Lucy island**, on the north shore of the passage, is separated from the south side of North island by a narrow channel, on the north shore of which is a small Indian village, called Tartanne, which was in former years a place of importance. A reef runs off the east end of Lucy island, and a wide shoal with kelp stretches eastward from the shore of the southern extremity of North island. Between these the channel extends with 8 to 11 fathoms water. Abreast the Indian village the depth in the channel is 6 fathoms.

**CAPE KNOX**, the north-west extreme of Graham island, is a long narrow tongue of land, on which are a few low hills. The cape may be considered as a gigantic dyke of igneous rock running in an east and west direction. Its south side is bold, and off it lie several rocks in a westerly direction, the farthest out at a distance of about  $3\frac{1}{2}$  miles off the cape. On these the swell of the Pacific seldom ceases to break with great violence. A rough trail about a mile in length leads from Kioo-sta village in Parry passage across the neck of the land at the base of the promontory of cape Knox to Lepas bay on the west-coast.

**DIRECTIONS.**—On leaving Bruin bay or Henslung cove for the westward, a vessel may pass close to the cliffs forming the southern side of North island, and keeping at about half a mile outside the reefs that run off the south shore (Graham island), get a good offing before hauling to the southward, to clear the rocks off cape Knox. When well out, the projecting point of Frederick island will be seen about 18 miles to the south-eastward. At 2 or 3 miles to the southward of Parry passage is an indentation of the shore, which might be taken as its entrance by a vessel coming from the southward,—a mistake that might lead to serious consequences, as the whole coast, as far as Frederick island, appears to contain several open bays, with outlying rocks off each of them. The Indians, in

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their sketches of this part of the coast, do not draw any harbours, but merely exposed bays.

**HIPPA ISLAND**, lying 26 miles S.E.  $\frac{1}{2}$  S. of Frederick island, appears from a position  $1\frac{1}{2}$  miles seaward of Frederick island as high and bold; but from the south its outer end appears as a low point, and the inner end bold. This portion of the coast is higher and more broken than the former, the openings appearing deeper, neither does it seem to have so many rocks lying off it. The Indians show some good harbours towards Hippa. When abreast Hippa island, Buck point, 27 miles distant, and also cape Henry, about 18 miles farther to the southward, can be seen, the coast presenting the same high and broken appearance as the preceding 26 miles. All the points along this part much resemble Buck point, which is rather low and rugged, jutting out from the high land at the back.

**BUCK POINT** is on the northern side of Skidegate channel, which leads through to Skidegate. It has a large high island just to the northward of it, and there is another, much smaller and peaked, standing out clear of the land at about 3 or 4 miles farther to the northward, and lying in the entrance of Cartwright sound, which is formed between Buck point on the south, and Hunter point on the north.

**SKIDEGATE CHANNEL**, the main entrance to which is about 7 or 8 miles to the eastward of Buck point, and is a little more than a mile in width. From the entrance the channel runs in an easterly direction for 6 or 7 miles to Log point, where it is a mile wide. This part of the channel affords no sheltered anchorage. At Log point the West narrows commence, which leads to Skidegate inlet. About a mile west of Log point a branch turns off to the southward for a mile, and then westward to the Pacific, which it enters about 3 miles to the southward of the main channel, forming an island  $5\frac{1}{2}$  miles long by 2 broad, and rising to an elevation of 1,000 to 2,000 feet.

This passage is only adapted for canoes or boats, as it is blocked by a bank at its eastern end, with not more than 4 feet on it at high water.

A vessel entering the main channel from the west might find anchorage in the entrance of this passage where it unites with the main channel.

**INSKIP CHANNEL** leads round the north side of Kuper island, and was first used by H.M.S. *Virago* in 1853. It is about  $8\frac{1}{2}$  miles long, and half a mile wide. A little without it, there are some small islands on either side, but there will be no difficulty in discovering the passage in. In the channel there was no bottom at 60 fathoms, but at the entrance a cast of 35 fathoms was obtained on a halibut bank. At a short distance inside the islands, on the north side of the entrance, is

a village belonging to the Kilkite tribe. Farther in, on the same side, and about  $3\frac{1}{2}$  miles up, is a deep opening, and where this and Moore channel meet are two other openings to harbours, with some small islands lying near them.

**MOORE CHANNEL**, on the south side of Kuper island, is named after Mr. George Moore, Master of H.M.S. *Thetis* in 1852. This officer made a survey of both it and Mitchell harbour whilst in that ship, during the time that a large number of adventurers from California had collected here to dig and search for gold, some of that metal having been discovered by the Indians. This channel is 5 miles long in an E.N.E. and W.S.W. direction, and half a mile wide, the shore on each side being bold of approach, high, and covered with trees nearly down to the water's edge. In mid-channel there is no bottom at 70 fathoms. On the north side, just without the entrance, are some small rocky islets, named Moresby islands, and on the south side, a few rocks close in shore.\*

**MITCHELL, or GOLD HARBOUR**, about  $2\frac{1}{2}$  miles deep and half a mile wide, is surrounded by precipitous and densely wooded hills, from 700 to 800 feet in height, and at its head in Thetis cove is a sandy beach and a stream of water. At  $1\frac{3}{4}$  miles up the harbour is Sansum island, a small spot covered with trees, and the ruins of a number of huts. The anchorage lies half a mile further on, in Thetis cove, keeping Sansum island on the port hand; the passage being a cable wide, with deep water. This cove is completely land-locked, but squalls, frequently accompanied by rain, come over the hills with considerable violence. At a good half mile from the mouth of the harbour, on the starboard side going in, is Thorn rock, with only 3 feet on it at low water; it lies about one cable from the shore, and on the opposite side, not quite at so great a distance from the land, but a little further out, is another rock. These are dangerous to vessels working in or out; but there is nothing to fear if the wind be fair and the ship kept mid-channel.

**DOUGLAS HARBOUR.**—At one mile to the westward of Mitchell harbour, and on the same side of Moore channel, is the entrance to Douglas harbour, apparently very similar to the former, from which it is separated by Josling peninsula.

**DIRECTIONS.**—The land being very high on both sides of the channels leading into the above harbours, influences the direction of the wind which is either right in or out. Winds with any westing blow in, and those with easting the contrary. A sailing vessel leaving Moore channel with a south-east wind should keep well over towards Hewlett

\* See Admiralty plan, Ports in Queen Charlotte islands, No. 2,162.

bay, to enable her to fetch clear of the Moresby islands, as the wind will be very unsteady until well clear of the high land to windward.

**TASOO HARBOUR.**—Cape Henry lies 3 miles from the entrance to Moore channel, and terminates in a steep slope with a hummock at the extremity; 17 miles to the southward of this is the entrance to Tasoo harbour, the intermediate coast being high, and rising abruptly from the sea. The entrance is short and narrow, but the harbour itself is extensive, with deep water in many places; the anchorage in it is near some small islands on the port hand going in; it has only been visited by a few of the Hudson Bay Company's officers.

Between Tasoo harbour and cape St. James are other openings, which, according to Indian report, lead into good harbours, the southernmost of which is that leading into Houston Stewart channel and Rose harbour. Inside Anthony island, and close to Houston Stewart channel, is an opening, called by the natives Lousecoone, and reported to be a good harbour, not unlike Rose harbour. This coast, excepting off Anthony island, is also apparently bold. The land near cape St. James has fewer trees on it than that to the northward.

**The NATIVES** (Haida Indians) of the Queen Charlotte islands are fond of travelling, and make voyages of several hundred miles in their canoes, visiting Sitka on the north, port Simpson to the north-east, and Victoria harbour on the south. They excel in the construction of their canoes.

**SUPPLIES.**—The banks in, and near Hecate strait, swept by strong currents, with the shore line of inlets and fiords, constitute the feeding grounds of the halibut and other fishes, which abound in the vicinity of the islands. The halibut is the most important, and is largely consumed by the natives; the dog-fish is also very abundant, and is taken for the manufacture of oil; salmon run up most of the streams in large numbers, especially in the autumn; herring are plentiful in some places, especially about Skidegate, at certain seasons; pollock or coal fish are caught on the north and west coast, and supplies an edible oil; flounders and plaice abound in some localities; cod and mackerel are also caught, and probably are abundant on certain banks at some seasons; while smaller fish and shell fish, oysters excepted, form an important item in the native dietary. From April to October the shell fish are reputed by the natives to be poisonous. Immense flocks of wild geese and duck visit the northern shores of the islands in the autumn. Potatoes grow in abundance in most parts, and thrive exceedingly well, forming an important article of food. These are all to be bought either for money, strong cotton shirts, cotton dresses, plain cotton, knives, tobacco, mother of pearl jacket buttons for

ornamenting their blankets, or any of the articles commonly bartered among savages. The blanket is now, however, the recognised currency.

Bears are numerous, and with martens, sea and land otters, are caught for their furs which are taken to the Hudson Bay Company's establishments at Fort Simpson, McLaughlin bay, or Fort Rupert, Beaver harbour.

**WIND and WEATHER.** — South-east winds are prevalent, and are almost invariably accompanied with thick rain; those from the opposite quarter generally bring fine weather. The weather is uncertain, and cannot be depended on for 24 hours at a time.

The heaviest rainfall is, however, local, taking place on the western mountains of Queen Charlotte islands. It may often be noted that while heavy rain is falling on the mountains the sky is comparatively clear over the strait to the eastward. From this circumstance the north-east part of Graham island is not subject to a heavy rainfall. Snow occasionally falls in winter.

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TABLE OF POSITIONS.

Place.	Particular spot.	Latitude North.			Longitude West.		
		°	'	"	°	'	"
Takush harbour, Smith sound -	Observation spot - - -	51	16	51	127	38	43
Fitz Hugh sound, Schooner retreat. }	Centre island - - -	51	28	10	127	44	38
" Safety cove	Observation spot - - -	51	31	49	127	56	23
" Welcome harbour -	Kelp point - - -	51	41	5	128	7	45
" Goldstream harbour	Hawser point - - -	51	43	19	128	0	34
" Namu harbour -	Observation spot - - -	51	51	44	127	52	23
Mc Laughlin bay, Lama passage	" spot - - -	52	8	37	128	10	18
Kynumt harbour - - -	" spot - - -	52	12	20	128	11	37
Port Blakeney, Millbank sound	" spot - - -	52	18	47	128	22	42
Bela-Kula anchorage, Burke channel. }	" spot - - -	52	22	42	126	48	4
Finlayson channel, Klemtoo anchorage. }	" spot - - -	52	34	22	128	32	9
" Carter bay - - -	" spot - - -	52	49	41	128	24	34
Holmes bay, Whale channel	" spot - - -	53	16	25	129	5	19
Coghlan anchorage - - -	" point - - -	53	22	44	129	17	15
Lowe inlet - - -	" spot - - -	53	32	30	129	35	48
Port Canaveral - - -	Squall point - - -	53	33	4	130	8	30
Klewuggit inlet - - -	Morning reef - - -	53	39	24	129	44	51
Alpha bay - - -	Observation spot - - -	53	52	1	130	17	34
Refuge bay, Edge passage	Table point - - -	54	3	50	130	32	10
Chatham sound, Qlawdzeet anchorage. }	Harris island - - -	54	12	59	130	45	40
" Metlah-Catlah bay -	Observation spot - - -	54	20	10	130	27	30
" Port Simpson - - -	" spot - - -	54	33	51	130	26	36
Nass bay - - -	" spot - - -	54	59	26	129	57	36
Nass river - - -	" spot - - -	55	3	54	129	31	54
Bear river - - -	" spot - - -	55	56	3	127	3	27
<i>Queen Charlotte Islands.</i>							
Cape St. James - - -	South extreme - - -	51	54	0	131	2	0
Houston Stewart channel	Observation spot - - -	52	9	22	131	4	16
Skidegate inlet - - -	" spot - - -	53	12	31	132	14	19
Virago sound - - -	Cape Edensaw - - -	54	4	30	132	21	30
Port Kuper - - -	Saneum island - - -	52	56	31	132	9	40

The longitudes depend on Shell Island, Beaver harbour, Vancouver island, being in 127° 25' 7" West of Greenwich, as determined by Captain G. H. Richards, R.N., from his surveys, in H.M. Ships *Plumper* and *Hecate*, in the years 1860-2.

## TIDE TABLE.

Place.	High Water, Full and Change.		Rise.		Place.	High Water, Full and Change.		Rise.	
	h.	m.	ft.	ft.		h.	m.	ft.	ft.
Takush harbour, Smith sound	1	0	14	11	Coghlan anchorage - -	0	30	18	14
Fitz-Hugh sound, Schooner retreat.	0	30	14	11	Lowe inlet - - -	0	30	17	15
„ Safety cove -	1	0	14	11	Klewngkit inlet, Grenville channel.	0	13	17	
„ Welcome harbour	noon		15-16	12-13	Stuart anchorage - -	0	30	17	
„ Goldstream harbour.	1	0	15	12	Alpha bay, Ogden channel -	1	0	20	
„ Namu harbour -	1	0	15	12½	Refuge bay, Laje passage -	1	30	17-22	14-17
Port John, Fisher channel -	1	0	13		Principe channel, Port Canaveral.	0	30	18	
Mc Laughlin bay, Lama passage.	1	0	14	8-10	„ Port Stephens -	0	30	18	
Kynumpt harbour - -	0	30	14	11	Chatham sound, Qlawdzet anchorage.	1	30	17-22	14-17
Port Blakeney, Millbank sound.	noon		13	8	„ Metlah-Callah	noon		21	
Finlayson channel, Nowiah cove.	noon		12		„ Port Simpson -	1	30	17-22	14-17
„ Klentoo passage -	noon		13	8	Nass bay - - -	1	5	23	
„ Carter bay - -	noon		13		Salmon cove, Observatory inlet.	1	8	16-23	
Whale channel, Holmes bay -	1	0	13	16	Portland canal - -	1	30	23-27	15-20
<i>Queen Charlotte Islands.</i>									
Skidgate inlet - - -	1	0	17	14	Virago sound - - -			13½	
Masseti, entrance of sound -			14½		Henslung cove - - -	0	20½	16½	
„ inlet - - -			8-10½		Port Keper - - -	1	40	13	10½

## INDEX.

	Page		Page
	34	Bar rocks, Skidegate	140-143
Aaltanhash	7	Barelay valley	99
Ala rock	10	Bardswell group	70
Aldenbrooke island	133	Bare island	39
Agglomerate island	148	— islet	21
Aln river	92	— rock	87
Alarm rock	1, 43	Barnard cove	8
Alaska	132	Barrier islands	68
Alder island	132	Bass rock	2
—, anchorage	23	Bate passage	62
Aldrich point	6, 28	Bath point	72
Alexandra passage	59	Bay islands	122
— patch	52	— islet	110, 143
Alford reefs	115	Bear Skin bay	123
Alice arm	131	— river	24
All Alone stone	141	Beaver bank	61
Allford bay	108	— harbour	62
Alpha bay	25	— ledge	6, 107
Anchor bay	9	— passage	71
— bight	39	— rock	42
— cove	140-142	Bedford island	43
— cove, Skidegate	9	— spit	14-19
— island	108	Bela-Kula anchorage	29
— mountain	62	Bell peak	16
Anchorage patch	91	Bella Bella islands	60
Anger island	6	Belletti point	61
Ann island	126, 128, 155	Ben hill	19
Anthony island	16	Bentineck arm	9, 32
Archibald point	99	Berry point	7
Aristazable island	53	Bertie rock	57
Arnour rock	69	Big bay	58
Arthur island	43	— anchorage	58
— passage	134, 136	— directions	134
A-tli inlet, Lyell island	148	Bigshy inlet	11
Awun river	45	Bird island	27
		— rock	61
Babine lake	131	Birnie island	133, 134
Bag harbour	144, 145	Bischoff islands	133
Ball, cape (Kul-tow-sis)	144	— anchorage	67
—, rock off	45	Black point	85
Bampffield islands	102	— rock	85
Banks island		— point	85

	Page		Page
Blakoney islet	94	Buck point	140, 153
——— passage	8	Bull point	9
——— port	26	Bulley bay	29
——— directions	27	Burke chunnel	14
——— supplies	27	Burnaby island	129-132
——— tides	27	——— strait	129-132
Blind reef	2	Burnt cliff island	58
Blinder rock	88	Bush islet	92
Block head	86	——— point	91
——— islets	90	Butterworth rocks	70
Blossom point	86		
Bloxham island	42	Calamity bay	102
——— passage	44	Calvert cape	10, 94
——— point	9	——— island	94
——— shoal	42	——— point	41
Blue point	122	Camp islet	86
Bluff point	82, 91, 121	——— point	16, 37, 120
———, Collison bay	129	Campania island	87
Blunden bay	4	——— sound	83
Boat cove	23	Campbell island	17
Bolkus islands	130	Canaveral port	92
Bonila island	104	——— directions	92
——— peak	104	——— tides	92
Boot island	15	Canoe bight	15
Boston islands	77	——— flat	112
Boulder bank	22	——— islet	91
——— head	21	——— rock	9
——— ledge	22	Cape islet	70
——— point	22	——— range	10
Boys rock	107	Cardena bay	43
Breaker group	95	Carpenter bay	128, 129
——— islets	102	———, anchorage	129
——— ledge	95	Carr islet	53
——— point	88	Carrington reefs	94
——— reef	2, 88	Carter bay	31
Breezy point	121	Gartwright sound	140, 153
Bribery island	45	Catherine point	127
Bright island	2, 9	Caution cape	3
British Columbia	1	Cecil patch	44
Brodio rock	74, 90	Centre island	1, 12, 121
Broken group	98	——— point	90
Brooke island	115	Cha-che-Kwas	100
Brown narrows	98	Chalmers anchorage	44
——— passage	70, 145	Chance rock	11
——— directions	71	Channel group	106
——— tides	71, 77	——— island	106
Browne island	8	——— islands	73
Browning passage	8	——— reef	4, 10, 84
Bruin bay	151	——— rock	82
———, anchorage	151		

INDEX.

Page		Page		Page
140, 153	Chapman point . . . . .	55	Cross point . . . . .	22
- 9	Charles point . . . . .	15	Cruice rock . . . . .	45
- 29	Chatham sound . . . . .	48	Cumming point . . . . .	35
- 14	_____ anchorages . . . . .	50	Cumshewa inlet . . . . .	136-140
129-132	_____ dangers . . . . .	49	_____ tides . . . . .	139
129-132	_____ east coast . . . . .	51	_____ anchorage . . . . .	139
- 52	_____ northern portion . . . . .	74	_____ rocks off . . . . .	139
- 92	_____ soundings . . . . .	49	_____ island . . . . .	139
- 91	_____ southern portion . . . . .	50	_____ to Spit point . . . . .	139
- 70	_____ west coast . . . . .	67	_____ village . . . . .	139
	Cheek Squintz . . . . .	25	Cunningham islands . . . . .	17
	Chismore passage . . . . .	44	_____ passage . . . . .	60
102	Choked passage . . . . .	63, 96	Curlew rock . . . . .	57
10, 94	Chroustoff, cape . . . . .	140	Curtis point . . . . .	102
94	Clam island . . . . .	14	_____ rock . . . . .	102
41	Cliff island . . . . .	13, 21, 23	Cypress island . . . . .	17
86	_____ islets . . . . .	91		
7, 120	_____ point . . . . .	103, 110, 122		
87	Climate . . . . .	66, 79, 118	Dall patch . . . . .	18
83	Clio bay . . . . .	47	Dana inlet . . . . .	136, 137
17	Clement's City harbour . . . . .	77	Danger patch . . . . .	33
92	Cloak bay . . . . .	151	_____ rocks . . . . .	128
92	Clown rock . . . . .	92	_____ shoal . . . . .	3
92	Cluster reefs . . . . .	6	Daring point . . . . .	46
15	Coast mound . . . . .	49, 72	Dark islet . . . . .	92
113	_____ nipple . . . . .	3	Darwin sound . . . . .	132, 134-136
91	Cod bank . . . . .	18, 77	_____ tides . . . . .	134
9	_____ reefs . . . . .	26	Davenport point . . . . .	86
70	Codfish passage . . . . .	98	Dawes point . . . . .	52
10	_____ rock . . . . .	96	_____ rock . . . . .	52
43	Coghlan anchorage . . . . .	37	Dawson point . . . . .	36
129	_____ rock . . . . .	74	_____ ledge . . . . .	37
129	Collision bay . . . . .	129	Day point . . . . .	20, 80
53	Comber rock . . . . .	11	Dead Tree point . . . . .	141, 143
94	Compton island . . . . .	109	Deadman island . . . . .	104
31	Cone island . . . . .	30	_____ islet . . . . .	90
53	_____ islet . . . . .	102	Deaue channel . . . . .	18, 47
27	Connel islands . . . . .	72	Deans point . . . . .	71
3	Connis rocks . . . . .	74, 107	De Horsey island . . . . .	47
14	Cooper inlet . . . . .	15	_____ la Beche inlet . . . . .	132
11	Copper bay . . . . .	139	Deep bay . . . . .	25
0	_____ islands . . . . .	129, 130, 132	_____ patch . . . . .	68
0	Cowitz coal mine . . . . .	141	Deer island . . . . .	17
4	Cox point . . . . .	102	_____ mound . . . . .	49
	Cranstown point . . . . .	9	_____ point . . . . .	90
	Crescent inlet . . . . .	135	Defeat point . . . . .	18
	Cridge islands . . . . .	53	Deluge point . . . . .	129, 130
	_____ passage . . . . .	85	Deny island . . . . .	15
	Cross islet . . . . .	120	_____ rock . . . . .	5
	_____ ledge . . . . .	22	Despair point . . . . .	90

	Page		Page
Detached island - - -	28	Elizabeth peak - - -	45
Devastation island - - -	53	----- rock - - -	44
Devil rock - - -	4	Ellen island - - -	127
Devils point - - -	83	Elliott island - - -	44
Dickens point - - -	120	----- point - - -	110
Digby islands - - -	53	Emma passage - - -	110
Dimple point - - -	92	End hill - - -	90
Discovery rocks - - -	21	Enfield rock - - -	52
Disraeli mount - - -	118	Entrance island - - -	137
Dixon entrance - - -	75	----- reef - - -	71
----- tides - - -	77	Entry cone - - -	10
----- island - - -	92	----- peak - - -	77
Dodd passage - - -	62	Escape reefs - - -	57
----- rock - - -	60	Essington port - - -	46
Dog island - - -	136	Estevan island - - -	101
Dogfish bay - - -	119	----- ledge - - -	88
Dionite narrows - - -	131, 132	----- sound - - -	87
-----, tides - - -	131	Ettrick rock - - -	50
Dolphin island - - -	105	Evans arm - - -	15
Don flat - - -	40	Evening point - - -	38
----- ledge - - -	68	----- rock - - -	13
----- point - - -	40, 81	Exposed arm - - -	40
Double island - - -	61	----- bay - - -	96
----- islet point - - -	113		
----- mountain - - -	141	Fairway rock - - -	96
Douglas channel - - -	35	False cone hill - - -	105
----- harbour - - -	154	----- Egg island - - -	7
Dowager island - - -	20, 24	----- grassy islet - - -	106
Dsootish bay - - -	9	----- Stuart anchorage - - -	42
Ducie island - - -	73	Farewell cape - - -	36
Duncan bay - - -	54	----- ledge - - -	36
----- dangers - - -	55	Faraday island - - -	133
----- directions - - -	55	Farrant island - - -	85
Dundas islands - - -	72	Fife cape - - -	143, 144
		-----, anchorage - - -	144
East point, Prevost island - - -	125	Fin island - - -	85
----- rock - - -	95	----- rock - - -	85
Echo harbour - - -	135, 136	Fingal island - - -	98
-----, anchorage - - -	135	----- ledges - - -	99
Eclipse island - - -	84	Finlayson channel - - -	29
Edensaw, cape - - -	149	----- island - - -	59
Edmund point - - -	14	Fish point - - -	108
Edward reef - - -	7	----- rocks - - -	8
Edge passage - - -	68	Fisher channel - - -	14, 18
----- directions - - -	69	Fisherman cove - - -	36
----- tides - - -	69	Fishing banks - - -	134, 155
Egg island - - -	5	Fitz-Hugh sound - - -	9
----- rocks - - -	5	----- directions - - -	10
Elizabeth island - - -	44		

	Page		Page
Fitz-Roy reef	94	Grabam island	125, 140, 143, 152, 156
Flat rock	128	reach	33
point	34, 110	Granite point	129, 130, 132
Top islands	58	Grassy islet	18, 49
Flower pot island	136, 137	Grave point	15
Fly basin	8	Green inlet	34
Fog rocks	14	islet	75
Fogs	79	, Skineuttle inlet	129-131
Foggy point	122	islets	122
Forsyth point	127	mound	60
Fort point	112	top island	50
Fortune point	59	top islet	91
Foua bay	103	Grenville channel	38
point	91	Grey islands	11
Fox gape	76	islet	75
Frank point	116	Gribbell island	54
Fraser reach	34	Grief bay	10, 94
Fraser river	45	ledge	103
Frederick island	152, 153	point	103
Frigate bay	11	Griffin mount	49
Fury point	82	Guano rocks	88
		Guide islet	90
		Gull rock	129
		rocks	50
		Gunboat harbour	42
		passage	17
Gale point	90	Haida indians	155
creek	19	Hakai channel	13, 95
Galiano island	2	directions	97
Gaucher islands	100	Halibut bank	134, 153, 155
Gardner channel	47	bay	120
Genn islands	45	rocks	103
George harbour	130	Hammond rock	74
hill	61	Handyside island	18
point	16	Hankin ledges	93
rock	7	point	93
Gibson islands	42	reefs	62
Gil island	36, 84	Hammer rock	70
mount	36, 84	Hannah rock	4
Gladstone mountain	124	Harbour bank	92
Guarled islands	8, 75	island	16, 96
Goat cove	30	ledge	96
Gold or Mitchell harbour	142, 154	reefs	62
Goldstream harbour	13	rock	37
Goletus channel	5	Harbourmaster point	15
Good Shelter cove	4	Harriet island	130
Goose islands	98	, harbour	130
ledge	100		
Gordon islets	128		
point	59		
Göschen island	68		
Gosling rocks	98		





	Page		Page
Khutze arm - - -	34	Lama passage - - -	15
Khutzeymateen inlet - - -	111	Lamb islet - - -	42
Kilawäläks - - -	114	Landslip mountain - - -	112
Kilkite tribe - - -	154	----- point - - -	35, 121
Kiltik creek - - -	14	Langford point - - -	127
Kin-gui island - - -	139	Larcom island - - -	116
Kincolith - - -	112	Larco channel - - -	82
Kingcombe point - - -	35	----- directions - - -	83
Kinnahan islands - - -	50	----- soundings - - -	83
Kioo-sta village - - -	151, 152	----- tides - - -	83
Kit-a-Kauze village - - -	114	----- sound - - -	80
Kititstu hill - - -	80	----- directions - - -	82
Kit-Kia-tah inlet - - -	39	Large Cridge island - - -	53
Kit-lah-kum-ka-dah village - - -	114	Lasceek bay - - -	136-138
Kit-min-i-ook village - - -	114	-----, anchorages - - -	136, 137
Kit-sah-Watl - - -	114	----- or Khu village - - -	136
Kitsagatla country - - -	46	Lawn point - - -	140-144
Kitson island - - -	50	----- hill - - -	143
Kitty parch - - -	27	----- to Rose point - - -	143, 144
Kiwash island - - -	13	Lawson harbour - - -	44
Klas-kwun point - - -	150, 151	Lawyer group - - -	45
Klekane arm - - -	35	Loading island - - -	40, 96, 142, 143
-----, inlet - - -	35	----- peak - - -	60, 95
Klentoo passage - - -	32	----- point - - -	86, 120
Klewnuggit inlet - - -	40	Ledge point - - -	85
----- anchorage - - -	41	Legge point - - -	32
----- directions - - -	41	Lepaa bay - - -	152
----- soundings - - -	41	Letitia point - - -	37
----- tides - - -	41	Lewis island - - -	43
Klick-Tso-Atli harbour - - -	16	----- passage - - -	35, 85
Kluu-kwoi bay - - -	185	Liddle island - - -	116
Knight island - - -	53	Limestone islands - - -	138
Knox cape - - -	150-152	----- rock - - -	131
-----, rocks off - - -	152	Limit island - - -	99
----- point - - -	61	----- point - - -	7
Kum-ea-lon inlet - - -	42	Lina island - - -	140
Kun-ga island - - -	136, 137	Lizard point - - -	110
Kung village, Virago sound - - -	149	Lizzie hill - - -	61
Kuper island - - -	153, 154	Lofty island - - -	93
Kwakshua channel - - -	13, 95	Log point - - -	142, 153
----- rock - - -	95	Logan inlet - - -	134, 136, 137
Kxn-gaal inlet - - -	42	----- point - - -	120
Kynumpt harbour - - -	18	Long arm - - -	140
		----- island - - -	7, 106
		----- point - - -	7, 27
		Loo rock - - -	14
Lady island - - -	22, 73	Lord island - - -	76
Lake island - - -	20	Louise island - - -	128, 136-138
Lak-Hou - - -	57	Louise harbour - - -	126, 155
Lak-Oh-witz - - -	51	Low island - - -	13, 138

	Page		Page
— point - - -	24, 81, 111	— Neil- mount - - -	49
— rock - - -	81, 129	Meadow island - - -	17
Lowe inlet - - -	39	Metlah-Catlah - - -	52
— anchorage - - -	40	— anchorage - - -	54
— supplies - - -	40	— population - - -	56
— tides - - -	40	— supplies - - -	56
Lucy group - - -	71	— tides - - -	56
— island - - -	151, 152	— village - - -	55
—, village (Tartanne) - - -	153	Middle Dundas island - - -	72
— islands - - -	51	— Gander island - - -	100
Luxana bay - - -	125	— passage - - -	47
Lyell island - - -	133, 134, 136, 137	— rock - - -	2, 99
—, A-tli inlet - - -	134	— rocks - - -	104
		Midge rocks - - -	53
Ma-min rivers - - -	148	Milbank sound - - -	20
Maast island - - -	147	—, directions - - -	24
Magin saddle - - -	2	—, soundings - - -	20
Main passage - - -	17, 75	Mink Trap bay - - -	91
Malucca passage - - -	45	Mission mountain - - -	49
Maple point - - -	38, 86, 121	— point - - -	54
Marble rock - - -	89	— valley - - -	112
Marchant rock - - -	102	Mitchell or Gold harbour - - -	138, 142, 154
Mark islet - - -	25	—, directions - - -	154
— nipple - - -	94	Moffatt islands - - -	73
— rock - - -	15	Molly point - - -	87
Marmot river - - -	123	Moore channel - - -	154
Marrack island - - -	43	— head - - -	126
— rock - - -	43	Monument rock - - -	131
Mary cove - - -	30	Moresby island - - -	125, 128-130, 140
— island - - -	21	—, mountains - - -	128, 132
Maskelye point - - -	67, 110	Morning reefs - - -	39
Masset sound - - -	147	Morris bay - - -	27
—, bar - - -	146	— anchorage - - -	28
—, harbour - - -	146	— supplies - - -	28
—, Hudson Bay Co. - - -	146	Moss passage - - -	24
—, inlet - - -	147, 148	Mouse rock - - -	21
—, missionary station - - -	146	Muckshwanno - - -	117
—, soundings off - - -	146	Mud islands - - -	113
—, tides - - -	148	Murehison island - - -	133
—, to Virago sound - - -	149	Murray cape - - -	145
Mathieson channel - - -	24	Mussel inlet - - -	30
Matliksimtas - - -	86	Mylor peninsula - - -	111
Mauds island - - -	140, 142		
— village - - -	142	Naas-Glee village - - -	45
Maze islands - - -	11	Nab rock - - -	81
Mc Cauley island - - -	91	Nabanzah bay - - -	39
— Grath mount - - -	48	Naden, cape - - -	149, 150
— Kay cove - - -	139	— harbour - - -	149, 150
— reach - - -	35	— river - - -	150
McLaughlin bay - - -	16, 156	Nakat inlet - - -	76

Page	Page	Page
49	Nalau islands - - - 95	Oar point - - - 91
17	passage - - - 13, 97	Oat-so-alis - - - 10
52	Namu harbour - - - 13	Observatory inlet - - - 114
54	anchorage - - - 14	ledge - - - 37
56	Napier point - - - 16	point - - - 37
56	Narrow island - - - 17	Observation point - - - 56
56	Narrows, East, Skidegate - - - 142	spot - - - 12, 18
56	West - - - 142, 153	Ogden channel - - - 105
55	, tides - - - 142	Oke island - - - 26
72	Nass bay - - - 115	reefs - - - 26
00	anchorage - - - 113	Oldfield mount - - - 48
47	tides - - - 113	One-tree island - - - 58
99	river - - - 113	islet - - - 61
04	directions - - - 114	Oona bay - - - 106
53	villages - - - 114	Open bay - - - 10
20	tides - - - 114	Oriflamme passage - - - 75
24	Nasoga gulf - - - 111	Osborne islands - - - 70
20	Natives (Haida indians) - - - 155	Oscar passage - - - 29
91	Neck point - - - 4	Outer anchorage - - - 59
49	Needle peak - - - 109	channel - - - 85
54	Nepean sound - - - 89	cove - - - 29
12	Nettle basin - - - 39	passage - - - 39
54	New patch - - - 4	shoal - - - 37
54	Nin-stints village - - - 128	Outer island - - - 20, 60
73	Nob islet - - - 110	Oval hill - - - 68
97	Noble point - - - 17	
54	North Bay islands - - - 81	
26	Bentinck arm - - - 14	
11	breaker - - - 70, 99	Pacific ocean - - - 126, 140, 152, 153
10	Channel islands - - - 82	Paddle rock - - - 9
12	Danger rocks - - - 103	Puddy passage - - - 115
39	Dundas islands - - - 73	Parkin islands - - - 67
7	Gander island - - - 100	Parry passage - - - 151, 152
8	Iron rock - - - 5	, directions - - - 152
8	island - - - 24, 151, 152	, tides - - - 151, 152
4	, anchorage - - - 151	Passage cone - - - 106
1	Island group - - - 22	island - - - 26, 87
7	ledges - - - 22	Pearce point - - - 69
3	Needle peak - - - 80	Pearl harbour - - - 59
1	passage - - - 10, 13, 32, 47	rocks - - - 3
0	, directions - - - 33	Pearse island - - - 109
	point - - - 9, 112	Peninsula point - - - 106
	pointers - - - 95	Penrose island - - - 7, 10
	rock - - - 3, 107	Percy point - - - 145
	rocks - - - 104	Peril rock - - - 15
	Surf islands - - - 84	Perry bay - - - 117
	twin islet - - - 106	Petrel channel - - - 92
	Watcher islet - - - 88	shoal - - - 8
	west rocks - - - 104	Peveril rock - - - 99
	Nowish - - - 29	Pike island - - - 53

	Page		Page
Pillar bay	151	Ramsay island	133, 134
—— rock (Hla-tad-zo-woh)	151	Ranger islet	112
Pine island	2	Raspberry cove	127
Pirie point	123	—— islands	47
Pitt island	41, 86	Red point	92
Plover island	13	—— Cliff point	34, 39
—— point	85	—— top mountain	135
Plumper channel	15, 98	Reef island	119, 138
Pointer island	15	Refuge bay	69
Pointers rocks	74	—— anchorage	70
Pole islet	17	—— Observation spot	70
Porcher island	44, 50	—— tides	70
Port reef	96	Regatta reefs	18
Portland canal	117	Reid island	2
—— tides	124	Remarkable cone mountain	15
—— inlet	109	Rempstone rocks	99
—— point	111	Restoration cove	19
Prescott island	67	Reverly Johnson mountain	123
Prevost island	125, 126	Richard point	115
Price island	23, 80	Richardson inlet	135, 136
Prince of Wales island	75	—— anchorage	136
Princess Royal island	33, 82	—— tides	136
Principe channel	89	—— timber	137
Promise island	36	Ripple bank	32, 57
—— ledge	37	—— tongue	113
—— point	26	River bight	86
Purple bluff	98	Rivers inlet	9
		Robinson mount	3
		Rock fish harbour	137
		——, anchorage	137
Qaldzæet anchorage	71	Roderick islands	29
—— observation spot	72	Rose harbour	126-128
—— tides	72	—— point (Nai-Koon)	78, 144
Qual-a-gute	98	——, anchorage	146
Quartermaster rock	52	—— to Masset sound	145
Quas-cillah	9	—— spit	144, 145
Queen's sound	97	Ross island	127
Queen Charlotte islands	75, 125, 155	Round point	123
——, general remarks	125	Rupert fort	61, 156
—— sound	2	Ryan point	56
Quel-ak-sea-hx	36		
Quinamas bay	111	Safe entrance	11
Quoin hill	7, 11	Safety cove	12
		Saint John harbour	25
		Salal point	27
Rachel group	74	Salmon cove	115
—— islands	51	—— tides	118
Rage reef	25	—— river	123
Rainfall, Queen Charlotte islands	156	—— bight	57
—— point	26		
Ramsden point	111		

Page		Page		Page
3, 134	Sandfly bay - - -	120	Simpson port, observation spot -	67
112	Sandspit point - - -	83, 96	----- supplies - - -	65
127	----- shoal - - -	83	----- tides - - -	67
47	Sandstone reef - - -	22	----- rock - - -	71
92	Sansum island - - -	154	Sisters islets - - -	29, 90
34, 59	Sarah island - - -	30	Sitka - - -	155
135	----- point - - -	61	Skaat harbour - - -	131
9, 138	Saw reef - - -	132	-----, anchorage - - -	131
69	Schooner ledge - - -	81	Skedans bay - - -	138
70	----- passage - - -	28, 107	----- islands - - -	138, 139
70	----- point - - -	81	----- race - - -	138
70	----- retreat - - -	10	----- village - - -	138
18	----- directions - - -	11	Skeena river - - -	45
2	----- tides - - -	11	----- anchorage - - -	47
15	Scudder point - - -	132	----- tides - - -	47
99	Sea bluff - - -	11	Skidegate inlet 105, 125, 139-143, 153, 155	
19	Seabreeze point - - -	46	-----, bar - - -	140, 143
123	Seaforth channel - - -	18	-----, coal - - -	141
115	----- anchorage - - -	19	-----, directions - - -	142, 143
55, 136	Sea Otter group - - -	3	-----, indians - - -	141
136	Seal rocks - - -	68, 83, 123	-----, tides - - -	143
136	Sealed passage - - -	2	-----, village - - -	141
137	Search islands - - -	6	----- channel - 125, 140, 142, 153	
32, 57	Secure anchorage - - -	11	-----, anchorage - - -	153
113	Sedgwick bay - - -	133	Skimoutie inlet - - -	129-131
86	Sedmond river - - -	127	-----, anchorage - - -	130
9	Selwyn inlet - - -	137	-----, North side - - -	130
3	Sentinel island - - -	100	-----, South side - - -	130
137	Serpent point - - -	15	-----, Western side - - -	130
137	Seymour, mount - - -	141	Sk'p river - - -	51
29	Shadwell passage - - -	1	Slab point - - -	122
26-128	----- directions - - -	2	Slate Chuck brook - - -	142
78, 144	Shangoi tribe - - -	128	Slip-a-ti-a island - - -	148
146	Sharp peak - - -	58	-----, tides - - -	148
145	Shattock point - - -	57	Slippery rock - - -	56
4, 145	Sheep passage - - -	30	Small Cridge island - - -	53
127	Shell island - - -	12	Smith inlet - - -	9
123	Ship anchorage - - -	41	----- island - - -	47
51, 156	----- passage - - -	8	----- sound - - -	5
56	----- rock - - -	9	Snow, Queen Charlotte islands - - -	156
11	Shower island - - -	5	Somerville island - - -	110
12	Shrab islet - - -	53, 102	Sophy islet - - -	117
25	----- point - - -	86	Sorrow island - - -	94
27	Shuttle island - - -	134, 135	----- islands - - -	10
115	Sierra de San Christoval - - -	135	Sound point - - -	18
118	Simpson fort - - -	63, 156	----- rock - - -	21
123	----- port - - -	61, 155	South bay - - -	140, 142
57	----- anchorage - - -	62	----- islands - - -	81
	----- climate - - -	66	----- Channel islands - - -	82
	----- directions - - -	63	----- sound - - -	128, 129

	Page		Page
South Dundas island	72	Surf islands -	84
—— Gander island	100	—— islet -	5
—— east arm -	119	—— point -	21
—— Gander islands	100	Surge narrows -	83
—— Iron rock -	5	Surprise patch -	8
—— island -	57, 140	Susan island -	29
—— Needle peak -	80	Suwance rock -	1
—— passage -	4, 13, 32	Swain cupe -	20
—— pointers -	95	Swallow island -	57
—— rock -	2	Swamp islet -	56
—— rocks -	103	—— point -	121
—— Surf islands -	84	Swanson bay -	34
—— twin islet -	106	Swindle island -	22, 32
—— Wutcher islet -	88		
Sparrowhawk breakers	101		
—— rock -	60	Table hill -	49, 73
Spicer island -	106	—— island -	6
Spider island -	97	—— mountain -	141, 142
Spit point -	119, 140	—— point -	70
Spray point -	83	Takush harbour -	8
Spur rock -	9	—— ———, anchorage -	9
Squall point -	92	—— ———, directions -	9
Squally channel -	84	—— ———, tides -	9
St. James, cape -	125, 126, 128, 155	Tal-un kwan island -	137
Stag rock -	41	Tan-oo island -	136
Stanley river -	150	Tangle cove -	130
Star island -	32	Tar islands -	133
Starfish group -	95	Tasoo harbour -	135, 155
—— ledge -	95	Telukwas -	10
Start point -	110	Telegraph passage -	46
Steamer passage -	17, 111	Terror point -	102
Steep point -	9, 81, 89, 122	—— rocks -	102
Stenhouse shoal -	70	Thetis cove -	154
Stephen island -	67, 145	Thom ledge and point -	37
—— rock -	92	Thorn ledge -	37
Stephens point -	37	—— point -	37
—— port -	90	—— rock -	154
—— ———, tides -	91	Thumb peak -	49
Stewart narrows -	37	Ti-tul island -	137
Stopford point -	120	Tide rip islands -	101
Storm islands -	2	Tie island -	7
—— island -	91	Tin-in-ow-e inlet -	147
Stripe mountain -	20	Tl-ell river -	143, 144
Stuart anchorage -	41	Tlechopcity harbour -	77
Stuamaun bay -	61	Tolmie rock -	83
Sugar-loaf hill -	95	—— channel -	83
Sunday island -	14	Tombstone bay -	121
Suaken rock -	2	Tam islet -	39
Superstition ledge -	97	Tomlinson mount -	112
—— point -	97		

	Page		Page
Tongas island	76	Virago sound	149, 150
Tonkin point	92	————, anchorage	149
Too-witt	24	————, tides	150
Tow hill	146	———— to cape Knoux	150
——-us-tas-in hill	148	Virgin rocks	3
Trade island	91		
Trap rocks	81		
Tree bluff	56		
—— islet	17		
——-nob groups	68		
—— point	119	Wales island	77
—— reef	119	—— point	77
Trefusis point	111	Walker point	14
Trevan rock	127	Wallace bight	30
Trivett point	35	Wanderer island	131
Trouble island	87	Wark island	35
Truro island	110	Warrior rocks	68
Truseott patch	69	Watch rock	3
Tsimpenn peninsula	51	Watson bay	30
Tsoo-skattli	147, 148	—— rock	42
Tuft island	133	Weather, Queen Charlotte islands	156
Tugwell island	52	Wedge point	30
Turn point	122	—— rock	32
Turtle point	36, 84	Welcome harbour	96
Twilight point	15	—— point	142, 143
Twins, the, mountains	131	Werner bay	132
		Westminster point	15
		West rock	21, 98
Union bay	110	Whale channel	35, 86
—— passage	86	Wheeler islet	91
Useless bay	69	Wheelock pass	17
Ut-te-was village, Masset	146	Whirlwind bay	14
—— Hudson Bay Co.'s post	146	White Cliff island	44, 57, 97
—— Missionary station	146	—— ledge	44
		—— point	122, 134
		—— rock	21, 100, 106
		—— rocks	7, 21, 75, 104
		—— stone	18
Vancouver island	1	Whitesand islet	73
—— rock	21	Whiting bank	40
Variation	1, 20, 48, 80, 94, 100, 125	Whitley point	75
Venn creek	54	William island	27
Verdure point	122	Winds	78, 156
Verney falls	39	Windy islet	119
—— passage	11, 35	—— islets	85
Vertical point	138	—— rock	85
——, race off	138	Wolf point	90
Vlew point	69	—— rock	96
Victoria	155	Wood island	25
Village bay	141	—— rocks	7
—— island	61	Woodcock landing	47
—— islands	141, 143		

	Page		Page
Work channel - - -	67	Ya-koun river - - -	148
Wreck point - - -	103	Yat-za village - - -	149, 150
Wright sound - - -	35, 85	Yellocki village - - -	98
		Yolk point - - -	38, 86
		York island - - -	109
Xschwan - - -	116	Zayas island - - -	73, 145

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11

