

yards off the coast of Chu San. A rock, with a depth of $1\frac{1}{4}$ fathoms over it, lies about $\frac{1}{2}$ mile north-northeastward of Tiang tiao chu. Sio chusan, an islet 70 feet high, is also on the northeastern side of North Bun Ji Channel in a position about $\frac{1}{2}$ mile east-northeastward of the same extremity. Fort Ding Yuen is on a point on the Chu San coast close northward of Sio chusan; there are two other forts on the coast northward of Nab Rock.

Anchorage in western approaches to Tinghai Harbor.—Vessels can obtain good anchorage between Siha Ji and Bun Ji in depths of 11 to 12 fathoms, over a bottom of mud. The tidal currents run more regularly and with somewhat less force towards the Bun Ji side of the channel. A British naval vessel anchored (1932) 1,450 yards 121° from the beacon on Kwo wu tiao, and also 1,050 yards 72° from the same beacon. In the former position the holding ground, stiff mud and shells, was good; both anchorages were uncomfortable, however, and the tidal currents were strong.

Vessels can also anchor between Nab Rock and Sio chusan in depths of 16 to 17 fathoms. This anchorage is not recommended, however; the tidal currents and eddies are strong.

Southern approaches to Tinghai Harbor.—**Melville Channel** is the principal channel leading to Tinghai Harbor from the southward. On the eastern side of the entrance to this channel is Hangfu Shan ($29^\circ 57' N.$, $122^\circ 07' E.$, *H. O. Chart 3213*), an islet 130 feet high near its northwestern extremity. On the western side of the entrance is Tsenyo Shan. Between Hangfu Shan and Tsenyo Shan Melville Channel has a width of about 1 mile. Tsenyo Shan (Elephant Island) has a rocky, precipitous hill, 700 feet high, in its southern part; the highest peak, 865 feet high, is in about the center of the island. Trunk Point is its eastern extremity; a bight northward of the point is filled by a flat.

On the western side of Melville Channel is Siaodun chi, an islet 50 feet high lying about 800 yards northeastward of the northeastern extremity of Tsenyo Shan. To dun chi Shan, an island with its southern extremity about 600 yards northwestward of Siaodun chi, attains in a conical hill, Harry Peak, in its central part a height of 245 feet. Duck Rocks, 1 foot high, lie about 200 yards southwestward of To dun chi Shan. To king Shan, an islet 85 feet high in its northwestern part, is about 400 yards northeastward of the northern extremity of To dun chi Shan. The Ledge, a reef drying 2 feet at its outer end, extends about 200 yards eastward from the eastern extremity of To king Shan; the tidal currents set strongly across The Ledge as soon as it is covered. A reef also extends about 150 yards northward from the northern extremity of To king Shan; The Cap, a rock 16 feet high, is on the outer end of this reef. Black Rock, 2 feet high,

lies in the middle of a detached reef about 300 yards northeastward of To king Shan.

On the eastern side of Melville Channel is Siaoju (Deer Island). Stone walls have been built connecting the various points between which the shores of Siaoju are indented; the reclaimed land is cultivated. Deer Point is the southwestern extremity of Siaoju. Three rounded summits rise near the center of the island; the northernmost and highest is 670 feet high. Mu Shan and another islet 27 feet high lie on a mud flat close off the southern side of Siaoju; this flat extends nearly to Deer Point. Melville Rock and Dundras Rock are also on the eastern side of Melville Channel. Melville Rock, over which the depth is $1\frac{1}{2}$ fathoms, is about 600 yards eastward of the eastern extremity of To king Shan; Dundras Rock, over which the depth is 1 fathom, is about 400 yards northward of Melville Rock.

The tidal currents between Siaoju and To dun chi Shan set northward from 3 hours before high water until $2\frac{1}{2}$ hours after high water, and southward from $2\frac{1}{2}$ hours after high water until 3 hours before the next high water; the tidal currents attain rates of 3 to 5 knots.

The tidal currents swirl around Melville Rock and Dundras Rock. That portion of Melville Channel between To king Shan and Sarah Island is more difficult to navigate than Deer Island Channel, although the tidal currents are also strong in the latter channel.

Deer Island Channel leads off northeastward from Melville Channel toward the outer anchorage of Tinghai Harbor. Siaoju forms the southeastern side of Deer Island Channel; the northwestern side is formed by a mud flat from which rise To ju and Sarah Island. To ju is 125 feet high in its northeastern part. Sarah Island is 60 feet high close within its northwestern side. Elliott Patch, between To ju and the northwestern extremity of Siaoju, lies near the middle of the narrowest part of the channel, and has over it a depth of $3\frac{1}{4}$ fathoms. Tsing tiao, about $\frac{1}{4}$ mile northeastward of To ju, is a small rock drying 1 foot; a patch about 200 yards east-northeastward of this rock has over it a depth of $1\frac{1}{2}$ fathoms.

South Bun Ji Channel trends northeastward to connect with Melville Channel westward of Sarah Island. On the northwestern side of the channel are the islands Ozo Shan, Wong ko Shan, Mun du Shan, Lau chi Shan, and Siaobun Ji. These islands are all within a distance of 900 yards of the southeastern coast of Bun Ji.

On the southeastern side of South Bun Ji Channel are the islands Totzu Shan, Siao tsen ya, Pe Shan, Kao Shan, Ling ju Shan, and To king Shan. To king Shan has been described; the other islands lie within a distance of $\frac{3}{4}$ mile southwestward of To king Shan.

South Bun Ji Channel should not be used. Davy Rock, over which the depth is $1\frac{1}{2}$ fathoms, lies in the middle of the southwestern en-

trance. Moreover, the channel is narrowed to a width of about 100 yards between the southeastern extremity of Siaobun Ji and The Cap; Eddy Rock, over which the depth is 1 fathom, is a danger lying about 100 yards off the southern extremity of Siaobun Ji. The tidal currents in South Bun Ji Channel attain rates of 3 to 5 knots.

Shenkia Channel and islands eastward of Melville Channel.—Shenkia Channel is an inshore passage along the southern coast of Chu San. Only vessels with local knowledge and drawing not more than 10 feet can proceed through Shenkia Channel. Lao Tio, a rock drying 6 feet, lies in the western entrance to this channel; a stone **beacon** marks this rock. The western entrance to the channel lies about $\frac{3}{4}$ mile northeastward of the northeastern extremity of Siaoju.

Ao Shan ($29^{\circ}57' N.$, $122^{\circ}09' E.$, *H. O. Chart 3212*) lies with its southern extremity nearly 3 miles northeastward of North Ketow Point (p. 352). A remarkable peak, 412 feet high, is in the southwestern part of Ao Shan. A spit, with depths less than 3 fathoms, extends nearly 1 mile eastward from the southeastern side of the island. The southern extremity of the island is steep-to, but the southwestern side of the island is fringed by a drying bank. Three rocks, 72 feet high, 8 feet high, and 12 feet high, respectively, lie within a distance of 600 yards southward of the southwestern extremity of Ao Shan.

Kun hi, a rock 63 feet high, lies about 1,200 yards westward of this extremity; the depths as far as $\frac{1}{4}$ mile westward of the rock are less than 5 fathoms.

Jan Ji lies about 800 yards northward of Ao Shan; a ridge extending northeastward and southwestward across Jan Ji attains heights of 338 to 350 feet. A flat extends about $2\frac{1}{2}$ miles southeastward from the southeastern side of Jan Ji; Mun du Shan and two other islets rise from this flat. Several rocky islets lie off the northwestern side of Jan Ji.

Sung Shan ($29^{\circ}58' N.$, $122^{\circ}07' E.$, *H. O. Chart 3213*) lies about 400 yards northwestward of Ao Shan. The island attains a height of 280 feet in its northwestern part. Sung san tio, a rocky ledge drying 6 feet, lies about 200 yards southward of the southwestern extremity of Sung Shan; a stone **beacon** marks Sung san tio. A rocky ledge drying 4 feet lies close southward of Sung san tio.

Ko Shan, an islet 70 feet high, lies about 400 yards northward of Sung Shan, and is covered with fir trees. Fangwo Shan, 60 feet high, lies about 400 yards northward of Ko Shan; a rock 3 feet high and a rock drying 3 feet lie between these islets.

The channel between the eastern side of Siaoju and Sung san tio, Sung Shan, Ko Shan and Fangwo Shan, is deep in the fairway but is little more than 200 yards wide in places; the tidal currents attain rates of 3 to 5 knots. Vessels should not attempt to pass through this channel.

TINGHAI HARBOR ($30^{\circ}00' N.$, $122^{\circ}06' E.$, *H. O. Chart 3213*) is entered from the southwestward through a channel between Middle Ground and the islands Siaowukwe Shan and Wukwe Shan. The harbor is entered from the southeastward through a channel between a bank off Wukwe Shan and the coast of Chu San.

The depths in Tinghai Harbor are 3 to 5 fathoms in the portion northward of Wukwe Shan and eastward of Middle Ground. The depths in the entrance channel from the southwestward are 5 fathoms; the least depth in the entrance channel from the southeastward is $3\frac{3}{4}$ fathoms.

Middle Ground is separated from Sio chusan (p. 360) to the westward by a deep channel about 200 yards wide. The least depth over Middle Ground is $1\frac{1}{2}$ fathoms. The channel between Middle Ground and Siaowukwe Shan and Wukwe Shan to the southeastward is about 300 yards wide.

Siaowukwe Shan lies with its western extremity about $\frac{3}{4}$ mile southeastward of Sio chusan. A ridge extending northward and southward along the eastern part of the island attains heights of 142 feet to 170 feet.

Wukwe Shan (Trumbull Island), a wooded island with a central summit about 265 feet high, is separated from Siaowukwe Shan to the southwestward by a narrow channel, Ko Lo Man. The fairway through this channel has depths of 4 to 7 fathoms. A bank, with depths less than 3 fathoms, extends about 500 yards eastward and 700 yards southeastward from Wukwe Shan. Grave Islet, 40 feet high, lies on the northeastern part of this bank in a position about $\frac{1}{4}$ mile northeastward of the summit of Wukwe Shan.

Parry Rock, drying 4 feet, lies about 350 yards northward of Grave Islet. The channel between Parry Rock and the coast of Chu San is deep; its width is about 100 yards. The wreck of a vessel, uncovering at low water, lies about $\frac{1}{4}$ mile northwestward of Parry Rock.

Joss Hill is on the coast of Chu San north-northwestward of Parry Rock.

Anchorage.—The outer anchorage, for large vessels, is northward of Tsing tio (p. 361). In a position with The Cap bearing 228° and in range with the northwestern side of Sarah Island, and with Grave Islet bearing 332° , the depth is about 12 fathoms. In this position the tidal currents are fairly steady in direction, and there are only a few eddies. Southeastward of Siaowukwe Shan the bottom is very uneven, and there are heavy swirls and eddies.

The inner anchorage, the best in Tinghai Harbor, is southwestward of Joss Hill. In a position with Grave Islet bearing 130° , and with the western extremity of Siaowukwe Shan bearing about 214° and just open northwestward of the northwestern extremity of Wukwe

Shan the depth is 6 fathoms. The tidal currents in this position are very strong and it is necessary to moor.

Boats can land alongside a floating pontoon at the eastern end of the town of Tinghai.

Directions.—Vessels approaching Tinghai Harbor from the westward should keep in the middle of Tower Hill Channel until they can pass about 1,200 yards northwestward of Tamao Shan. The route to be followed through Haji Ko and through North Bun Ji Channel is shown by a dashed line on H. O. Chart 3213.

Vessels proceeding to the inner anchorage can pass southeastward of Middle Ground through the entrance channel from the southwestward by keeping Tower Hill, on Tamao Shan, bearing about 222° astern and showing over the southern slope of the hills on Bun Ji. Vessels proceeding through this channel should pass about 200 yards northwestward of Siaowukwe Shan and Wukwe Shan; when the tidal current is setting in a southeasterly direction care must be taken against being set on to the western extremity of Siaowukwe Shan.

To enter Tinghai Harbor by the eastern entrance a north-northwesterly course should be steered from the outer anchorage so as to pass about 200 yards eastward of Grave Islet; care must be taken to avoid the bank extending southeastward from Wukwe Shan. A midchannel course between Parry Rock and the coast of Chu San should then be steered, and course altered westward as necessary to reach the inner anchorage.

Vessels approaching Tinghai Harbor by way of Melville Channel should enter the channel with the north-going tidal current. From abreast Roundabout Island (p. 350) a northwesterly course should be steered for the channel entrance. A vessel should pass fairly close eastward of Siaodun chi. After passing this islet, Trunk Point, on Tsenyo Shan, should be brought to bear 184° astern and in range with the eastern side of Siaodun chi. This course leads between The Ledge and Melville Rocks, and also between Black Rock and Dundas Rock. When past Sarah Island the outer or inner anchorage may be reached by following the directions already given.

Vessels proceeding through Deer Island Channel should keep to the Siaoju side of the channel to avoid Melville Rock and the mud flat extending southeastward from Sarah Island. No mark exists to aid in clearing Elliot Patch; the channel southeastward of the patch is wider and deeper than the channel to the northwestward. Vessels may pass on either side of Tsing tio, noting that a 1½-fathom patch lies about 200 yards east-northeastward of this rock.

TINGHAI (30° 01' N., 122° 06' E., H. O. Chart 3213), the principal city of the Chusan Archipelago, lies a short distance northward of the harbor. A wall about 2 miles long encloses the city; nearly encircling the wall is a canal that enters the city through the south gate. This canal connects with a network of canals forming an important means of communication and transport in the vicinity of the city. Tinghai has a population of around 40,000.

Supplies.—Drinking water is delivered in sampans.
Communications.—There is communication by steamer with Shanghai, Wenchow, Ningpo, Taichow, and other ports.
Radio station.—A radio station in Tinghai is open to public correspondence.
Hospital.—There is a hospital in the city.

THE YUNG RIVER (B. A. Chart 1199 and H. O. Chart 3214) flows into the sea about 1½ miles westward of Changtiao Tsui (p. 357). The city of Ningpo is situated about 12 miles within the Yung River entrance. Above Ningpo the Yung River consists of Yuyao Branch and Fenghwa Branch. The Yuyao Branch flows generally eastward and southeastward to Ningpo, and has on its banks the town of Yuyao in a position about 25 miles west-northwestward of Ningpo. The Fenghwa Branch flows generally northward and northeastward to Ningpo, and has on its banks the town of Fenghwa in a position about 13 miles south-southwestward of Ningpo.

APPROACH TO THE YUNG RIVER.—**Tsili (Square Island)** (30° 00' N., 121° 45' E., H. O. Chart 3214) lies about 1½ miles northward of Changtiao Tsui. The island is bold and rocky, and is dark-colored; its northern side is precipitous. A **light** is shown from a white octagonal tower, 33 feet high, near the northeastern end of the island. An occasional **fog signal** is made with a gun. (See Light List.)

The depths around Tsili are very irregular; at a distance of about 200 yards eastward and 100 yards southward of the island there are depths of over 10 fathoms. A short distance farther southward and southeastward the depths decrease to 3¼ and 4½ fathoms, and then increase to over 10 fathoms about ¾ mile from the mainland. The depths westward of the island are much less than the depths to the eastward; a bank, with depths less than 3 fathoms, extends in a northwesterly direction from a position about 400 yards westward of the island.

Wreck—Shoal.—The wreck of a large, heavily laden junk, dangerous to navigation, lies approximately 1,200 yards southeastward of Tsili.

A vessel drawing 18 feet reported grounding (1930) in a position 1,700 yards northwestward of Tsili.

Tayu Shan is an island consisting of a northern portion, 75 feet high, and a southern portion, 124 feet high. The latter, about equal in size to the other portion, lies over ¾ mile west-northwestward of Changtiao Tsui. The eastern extremity of the southern portion is a rocky ledge, partly awash at high water. Nemesis Rock, about 200 yards northeastward of this extremity, dries 2 feet, and is marked by a red spar **beacon** surmounted by a daymark. A bank extends from the mainland southeastward of Nemesis Rock; the least depth in the channel between the rock and this bank is 2¼ fathoms.

Siaoyu Shan, an island 100 feet high, lies near the southern outer edge of a drying mud bank that extends about 600 yards westward from the western side of Tayu Shan. Both of these islands are cliffy, with rocky coasts; they are covered with grass, and are light-colored.

Sesostris Rock, about 400 yards south-southwestward of the southwestern extremity of Siaoyu Shan, is a pinnacle rock over which the depth is $1\frac{1}{4}$ fathoms. A black and red checkered buoy, surmounted by a black daymark, is moored close northward of the rock. The least depth in the channel between Sesostris Rock and Siaoyu Shan is $3\frac{1}{2}$ fathoms; the channel southward of the rock is shoal and is not used.

Futsun Shan (Tiger Islet), about $\frac{1}{2}$ mile west-southwestward of the southwestern extremity of Siaoyu Shan, is a precipitous, dark-colored, rocky islet. A light is shown from an octagonal tower, 30 feet high and painted in red and white vertical stripes, on the summit of the islet. The fog signal is a gong. (See Light List.) The keeper's dwelling is also painted in red and white vertical stripes. Boats can land in fine weather on the southern side of Futsun Shan; with southwesterly winds boats can land between the rocks on the northern side of the islet. The depths in the channel between Futsun Shan and Sesostris Rock are 2 to $2\frac{3}{4}$ fathoms.

Tiger's Tail (Huwei Shih) consists of three drying rocks; the outermost lies about 250 yards northwestward of Futsun Shan, and is marked by a black iron beacon surmounted by a white daymark. The other rocks lie close southward and southeastward of the outermost rock.

The tidal currents set northwestward past Tsili and Changtiao Tsui from 4 hours before high water until 2 hours after high water, and southeastward from 2 hours after high water until 4 hours before the next high water. Note that the duration of the currents is variable, and that the intervals just mentioned are only approximate. The currents attain rates of 2 to 6 knots according to the age of the moon and the time of the tide.

Directions.—Vessels approaching the Yung River entrance from the northward should pass about 800 yards westward of Tap Islet, and about the same distance westward of the southwestern extremity of Taping. A southerly course should be maintained until the temples on Chaopao Shan bear about 240° , and are in range with the southeastern side of Tayu Shan. A southwesterly course should then be steered until Futsun Shan lighthouse bears about 254° and is open southward of Tayu Shan. This range leads to positions near Nemesis Rock, where the pilot boat will be met.

Vessels approaching the Yung River entrance by way of Kintang Channel should pass $\frac{1}{2}$ mile northward of Yu en su; courses should then be steered so as to pass $\frac{1}{2}$ mile southward of Just in the Way

and the same distance southward of Alligator Reef. A course that passes about 800 yards northward of Blonde Rock then leads to a position where the 254° course for Futsun Shan can be followed.

ENTRANCE TO THE YUNG RIVER (*H. O. Chart 3214*).—The western point of the entrance to the Yung River is a promontory rising to an elevation of 291 feet in Chaopao Shan (Citadel Hill); on the summit of Chaopao Shan are two large temples. The land for a distance of many miles within the promontory is flat.

The eastern side of the entrance to the Yung River consists of extensive areas of flat land interspersed with hilly ridges. One ridge extends nearly $2\frac{1}{2}$ miles south-southwestward from Changtiao Tsui.

Li Shan, a hill 236 feet high, lies over 1 mile west-southwestward of Changtiao Tsui; a lookout tower is on the summit of Li Shan. Wangyuan Fort is close northeastward of Li Shan, and marks the western point of the entrance to Siaokang Kow, a creek available to small craft only.

Kinki Shan, about 1 mile southwestward of Li Shan, is a hill, 329 feet high, with a mound on its summit. A ridge extends about 1 mile south-southwestward from Kinki Shan; the creek, Siaokang Kow, trends between this ridge and the ridge extending south-southwestward from Changtiao Tsui.

Suiyuan Fort stands near the outer edge of a reef extending about 200 yards northeastward into the Yung River from the shore at the foot of Kinki Shan. Anyuan Fort is on the east bank of the river abreast Suiyuan Fort.

Numerous junks and other small craft, both moored and underway, are always to be met with in the entrance to the Yung River.

Entrance bar—Depths.—The depths in the approaches to the Yung River, and in the river itself, have altered considerably in recent years; the charts must be used with caution.

The entrance bar is of mud, and extends as far as $1\frac{1}{4}$ miles into the river from a position about 200 yards southward of Futsun Shan. In 1935 it was reported that the depths in the channel over the bar were 10 to 12 feet only. Heavy freshets exert a scouring action on this channel.

The least depth in the fairway to Ningpo was 9 feet in 1928. Strong winds between north and northeast usually raise the water level in the river about $1\frac{1}{2}$ feet above normal. Strong winds between north and northwest retard the outflow of the ebb tide considerably, and cause irregularity in the normal times of low water.

In 1935 vessels drawing $19\frac{1}{2}$ feet could proceed to Ningpo; vessels drawing not more than 10 feet could enter the river at any stage of the tide.

Anchorage off Yung River entrance.—Vessels unable to cross the bar in the Yung River entrance, and those awaiting a favorable

tide, can secure good anchorage southward of Tayu Shan. The depths in a position with Tsili Lighthouse bearing 19° and in range with the eastern extremity of Tayu Shan, and with Futsun Shan bearing 258° , are 8 fathoms. This position is convenient for communication with Chinhai.

Tidal currents.—The ingoing current commences 4 hours before high water, and the out-going current commences $1\frac{1}{2}$ hours after high water; rates of 1 to 3 knots are attained according to the age of the moon and the time of the tide. After heavy rain inland the out-going current often runs for about 12 hours, and vessels do not swing to the ingoing current; this condition does not, however, appreciably affect the time of high water.

Pilots.—Vessels should not enter the Yung River without a pilot. The services of licensed pilots can be arranged for by communicating with the Ningpo harbor master before arriving off the entrance. The pilot boat is a sampan; the usual pilot flag is displayed. The pilot usually meets vessels in the vicinity of Nemesis Rock or Tsili.

CHINHAI HARBOR ($29^{\circ}57' N.$, $121^{\circ}43' E.$, *H. O. Chart 3214*) is a section of the Yung River about $1\frac{1}{4}$ miles long. The lower limit of the harbor, just within the entrance, is a line connecting Suiyuan Fort and Anyuan Fort. The town of Chinhai lies on the west bank of the river; the town of Wangkiatang is on the opposite bank abreast Chinhai.

The harbor is not available to vessels of length greater than 350 feet.

Depths.—The depths over the bar in the Yung entrance are given on page 367. Vessels drawing up to 20 feet can enter the harbor at high water of spring tides; at high water of neap tides the limit is $18\frac{1}{2}$ feet.

In 1937 a vessel drawing 19 feet proceeded through Chinhai Harbor to Ningpo Anchorage.

Light.—A light (see Light List) is shown from a black beacon, 30 feet high, with a concrete base and a black spherical daymark; this beacon is at the head of a stone jetty off Wangkiatang.

Anchorage.—Vessels can anchor off the southeastern corner of Chinnai in a depth of 5 fathoms; it is necessary to moor. The navigable channel above this position is about 200 yards wide, and is usually crowded with junks.

Quarantine anchorage—Regulations.—The quarantine anchorage is off Sankiapu, which is on the north bank a short distance from the upper harbor limit. The fairway must be kept clear.

The port health officer inspects vessels; infected or suspected vessels must display the quarantine flag. An infected vessel is one on board which there is a person suffering from an infectious disease; on which such a disease has existed within 10 days of arrival off Chinhai; or one with the body of a person who has died of what appears to have been

an infectious disease. A suspected vessel is one that arrives off Chinhai within 10 days of departure from an infected port, whether a stop has been made at an intermediate port or not; a vessel on board which a death has occurred during the voyage from the last port is also a suspected vessel.

Infected and suspected vessels proceeding to Ningpo Anchorage must display the quarantine flag on approaching Chinhai and keep the flag flying until the quarantine anchorage off Ningpo (p. 371) is reached.

Anchorage for vessels laden with dangerous cargo.—Vessels laden with dangerous cargo must anchor in the quarantine anchorage area.

Storm signals.—These signals are displayed at a station adjacent to the maritime customs suboffice, which lies on the west bank about $\frac{1}{2}$ mile above Anyuan Fort. The supplementary system (p. 31) is used.

The direction from which gales are expected is signaled as follows:

Gales commencing with the wind in the northwest quadrant:

By day; one cone, point upward.

By night; two red lights, one above the other.

Gales commencing with the wind in the northeast quadrant:

By day; two cones, one above the other, points upward.

By night; a red light above a white light.

Gales commencing with the wind in the southeast quadrant:

By day; two cones, one above the other, points downward.

By night; a white light above a red light.

Gales commencing with the wind in the southwest quadrant:

By day; one cone, point upward.

By night; two white lights, one above the other.

These direction symbols are hoisted on the north yardarm for gales from the northwest and the northeast, and on the south yardarm for gales from the southwest and southeast.

Port signals.—The system of port signals in use at Chinhai Harbor is described on p. 41.

Tides.—The mean high water interval at Chinhai is 0h.00m.; the mean range is 5.7 feet, and the spring range is 7 feet.

The winds affect the rise, range, and time of the tide. The tide levels are about $1\frac{1}{2}$ feet lower from December to March than from August to September.

CHINHAI ($29^{\circ}57' N.$, $121^{\circ}42' E.$, *H. O. Chart 3214*) lies on the western and northern sides of a bend in the Yung River a short distance within the entrance. A massive wall, of an approximate square outline, encloses the city. The northern wall continues westward to protect the flat country inland from the inroads of the sea.

Pontoons.—There is a pontoon 220 feet long and a pontoon 177 feet long, the depth alongside each of which is 16 feet. There are several smaller pontoons and wharves. Vessels load and discharge cargo alongside pontoons.

Communications.—There is daily communication by steamer with Shanghai, and with other nearby ports at less frequent intervals.

Telegraph messages can be sent to all parts of China from Changhai, and can be relayed to countries overseas.

Hospital.—There is a small hospital in Changhai.

YUNG RIVER BETWEEN CHINHAIR HARBOR AND NINGPO ANCHORAGE (*H. O. Chart 3214*).—The city of Ningpo is about 12 miles within the entrance to the Yung River. From Ningpo Anchorage, off the city, the river trends generally east-northeastward toward the entrance. This section of the river flows through low, flat country that is highly cultivated. There are many small villages along the banks.

Lights.—A light is exhibited from a wooden pole, surmounted by a black sphere, situated on the north bank of the river a short distance above the upper limit of Changhai Harbor.

A light is shown from a similar structure on the north bank near Meisu, a small village on the south bank about midway between Changhai Harbor and Ningpo Anchorage.

NINGPO ANCHORAGE (*29°52' N., 121°33' E., H. O. Chart 3214*).—Ningpo Anchorage, also called Ningpo Harbor, is a section of the Yung River at the confluence of the Yuyao Branch and the Fenghwa Branch (p. 365). A short section of the Yuyao Branch is within the harbor limits; the lower harbor limit is about 1 mile downriver from the junction. The lower limit is nearly abreast the foreign cemetery, close to which is a flagstaff.

Ningpo Anchorage is not available to vessels longer than 350 feet.

Depths.—The depths over the bar in the Yung River entrance are given on page 367.

The largest vessel arriving off Ningpo in 1937 was 355 feet long and drew 17 feet of water. During the same year a vessel drawing 19 feet arrived off the city.

Anchorage.—Vessels moor in midriver in the lower portion of the harbor. There are four swinging berths in depths of 3½ to 5 fathoms. No. 1 Berth is close above the customhouse; No. 2 Berth is between the customhouse and the former British consulate; No. 3 Berth is off a stone yard below the consulate; No. 4 Berth is abreast the foreign cemetery marking the lower harbor limit. The customhouse is on the west bank less than ¼ mile below the junction of the Yung River branches; the former British consulate, a red building, is on the same bank about 350 yards below the customhouse.

The bottom is soft mud. It is advisable to have a taut moor, with four shackles on the upstream cable and three shackles on the downstream cable. Vessels coming in with the flood current anchor above their berth, swing to their anchors, keeping them at short stay, then weigh and moor.

There is only about 600 feet of swinging room; vessels over 300 feet long must keep up steam and use their engines when swinging to the tides.

The most convenient landing place is at the customhouse, but there is not sufficient depth for a boat from 2 hours before low water to 2 hours after low water. If requested, the customs officials place a sampan in a position such that landing can be made.

Anchorage for vessels handling dangerous cargo.—Vessels arriving with mineral oil or cargo of a highly inflammable nature must anchor about 2 miles below the lower harbor limit; the customs officials issue instructions regarding the handling of such cargo.

Quarantine anchorage.—The quarantine anchorage is about 3½ miles below the lower harbor limit; this anchorage section is a short distance above the light near the village of Meisu.

Storm signals.—The storm signal station is adjacent to the customhouse. The system of storm signals and direction signals used at Changhai (p. 369) is also used at Ningpo. The direction symbols are hoisted on the northwest yardarm for gales from the northwest and northeast, and on the southeast yardarm for gales from the southwest and southeast.

Port signals.—The system of port signals used at Ningpo is described on page 41.

Tidal currents.—The maximum rate of the flood current is about 2 knots; the maximum rate of the ebb current is 2 to 3 knots. At neap tides in late September 1935, it was observed that there was no morning flood current on 3 successive days; instead, there were periods of slack water of 1 to 2 hours duration. High water at Ningpo occurs 1 hour after high water at Tsili.

Pilotage.—Pilotage is not compulsory but is advisable. It is necessary to arrange for the pilot in advance. A pilot is stationed at Changhai; overseas vessels proceeding to Ningpo without previous experience are usually met by the pilot in the vicinity of Tsili.

NINGPO (*29°53' N., 121°33' E., H. O. Chart 3214*).—The principal section of the city of Ningpo lies above the junction of the Yuyao Branch and the Fenghwa Branch. The walls of the city extend along the banks of both branches. The foreign settlement is on the western bank of the main river. A bridge of boats connects the foreign settlement with the principal portion of Ningpo. A similar bridge across the Fenghwa is being replaced by an iron bridge, according to one report.

Ningpo is an important fishing center. The population in 1938 was about 250,000.

Wharves.—Seven wharves in Ningpo, three of which are outside the harbor limits, have a total frontage of over 1,000 feet. The depths alongside vary from 12 feet to 24 feet.

The cargo of vessels alongside wharves is handled by hand labor; lighters, open native cargo boats of 15 to 20 tons capacity, are available to vessels at anchor.

Repairs.—Small repairs and overhauls are undertaken. There is a small drydock.

Supplies.—Provisions and deck and engineers' supplies are procurable in limited amounts.

Water for boilers and for drinking can be had. Large quantities are supplied on 2 days' notice. Drinking water should be boiled.

Fuel oil and Diesel fuel is delivered in drums. Limited stocks are maintained. Coal from a stock of about 8,000 tons is delivered in barges.

Communications.—There is daily communication with Shanghai by steamer, and with nearby ports at less frequent intervals.

A railroad line connects Ningpo with Hangchow and Shanghai.

Telegrams can be sent from Ningpo to all parts of China, and can be relayed to countries overseas.

Sanitary conditions—Hospitals.—The diseases prevalent in Asia, including smallpox, cholera, and dysentery, must be guarded against.

There are seven small general hospitals in Ningpo; the American Missionary Hospital is recommended.

HANGCHOW BAY (*H. O. Chart 5495*) lies westward of a line joining Yangtze Cape and the entrance to the Yung River. At the head of the bay is the estuary of the Tsientang Kiang. The important city of Hangchow lies about 20 miles up this river.

Northern shore of Hangchow Bay.—The northern shore of Hangchow Bay between Yangtze Cape and the city of Chapu, about 42 miles west-southwestward, is low; a mud bank fronting this section dries out as far as 2 miles in places. The walled city of Kinshan (Chinshan) lies on the coast about 30 miles west-southwestward of Yangtze Cape.

Chapu (*30°36' N., 121°05' E., B. A. Chart 1199*), formerly the port for Hangchow, is now little more than a fishing village. A ridge of hills, with a summit 509 feet high, is a mark for Chapu; the ridge is parallel to the coast and is about 3½ miles long. The city is on the western side of a small bay which is entered westward of this ridge. The anchorage within the bay is sheltered from east-northeast through north to south-southwest.

Holley Islet is the outermost of several islets that lie off the coast in the vicinity of Chapu. Holley Islet is southeastward of the city, and about 1 mile offshore. Ta meng Shan is an islet lying about ½ mile north-northeastward of Holley Islet. On another islet, close to the coast in a position about 2 miles eastward of the city, is a conspicuous white house.

A **light**, privately maintained, is shown on the summit of Ta meng Shan; another **light**, also privately maintained, is shown on the coast in a position about 1½ miles northwestward of Holley Islet.

The roadstead off Chapu is protected from the eastward by these islets; the tidal currents attain rates of 5 to 6 knots at springs. Chapu is connected with the general telegraph system.

The coast between Chapu and Haiyen, about 8½ miles southwestward, is fronted by a partly drying mud flat extending as far as 1 mile offshore in places. The outer edge of this flat is steep-to; sounding gives no indication of nearness to it.

Rambler Islet lies about 11½ miles southwestward of Holley Islet; Rambler Islet is very small, and lies close off the coast in a position about 5 miles southward of the town of Haiyen.

Southern shore of Hangchow Bay.—The coast between the Yung River entrance and Fulung Shan, about 11½ miles northwestward, is alternately hilly and flat. The land within this section is cultivated, and is protected against the sea by an embankment. A mud bank dries out for about 1¾ miles outside this embankment. Niloshan, an islet 222 feet high, lies on this mud bank in a position about 7 miles northwestward of the Yung River entrance; there are several rocks off the northern side of the islet. A **light**, privately maintained, is shown from a white tower on the summit of Niloshan.

Fulung Shan is a bluff headland, 917 feet high. Northwestward of the headland and the land is low and cultivated, and is fronted by a broad mud bank. It is reported that a vessel touching this bank is immediately turned over by the tidal current, which attains a velocity of 6 knots at springs.

Islets and dangers in Hangchow Bay.—Nanho (Tunghuoshan), an islet 197 feet high, lies about 11½ miles northeastward of Fulung Shan. A shoal, with depths less than 3 fathoms, extends about 400 yards northwestward from its northwestern side. Wangchiao, a rock 25 feet high, lies about ¾ mile northward of Nanho; foul ground extends nearly 400 yards northward and southward from Wangchiao.

West Stork Islet (Hsihuoshan), 144 feet high, lies about 3½ miles westward of Wangchiao, and has an islet, 94 feet high, close off its southeastern side. The Reef Islets (Changtanshan) consist of several islets and rocks; the largest islet is 77 feet high and lies about 2¼ miles west-southwestward of West Stork Islet. These islets and rocks lie at the southeastern end of an extensive patch of foul ground, on which are numerous drying rocks surrounded by soft mud and quick sand. The Seven Sisters (Chitzumei) lie on this foul ground within a distance of 3 miles northward of the Reef Islets. The largest islet of the Seven Sisters group is 140 feet high.

East Seshan (Chuyu Shan) consists of a group of islets and rocks; the largest islet is 271 feet high, and lies about 19 miles northward of Nanho. Middle Seshan (Su Shan) is an island lying nearly 5 miles west-northwestward of East Seshan; there are several islets and rocks around Middle Seshan. House Islet, about 2¾ miles southwestward of Middle Seshan, is cliffy; a small islet lies about 1 mile northeastward of House Islet, and a rock, with foul ground surrounding it to a distance of nearly ¼ mile, lies about 1¼ miles southeastward of House Islet. There are numerous fishing stakes between all these islets and the northern shore of Hangchow Bay.

West Seshan (Chinshan) consists of three islets; the largest is 298 feet high, and lies about 10 miles northwestward of House Islet.

Flat Fog (Wangpan) is an islet about 13 miles west-southwestward of House Islet; two small islets lie within ½ mile southward of Flat

Fog. Gap Fog consists of two small islets; the southern islet is about $1\frac{1}{2}$ miles westward of Flat Fog.

THE TSIENTANG KIANG. (*H. O. Chart 5495*).—Rambler Islet marks the northern point of the estuary of the Tsientang Kiang. The estuary is shallow, and drying flats extend off either shore. Bore Shelter Bay ($30^{\circ}22' N.$, $120^{\circ}44' E.$, *H. O. Chart 5495*) is on the northern bank of the estuary about 13 miles from Rambler Islet. The town of Haining, also on the northern shore, is about 23 miles from Rambler Islet.

Navigation of Tsientang Kiang.—Oceangoing vessels proceed no farther than Rambler Islet. Steam or motor boats drawing not more than 3 feet can proceed to the city of Hangchow, about 39 miles from Rambler Islet. By starting at half-tide and with a minimum flood current of 3 knots, these craft can reach Haining before high water at the latter place by maintaining a speed of not less than 4 knots. These craft usually await the passing of the bore of the Tsientang Kiang by grounding near junk shelters on the southern shore of the estuary abreast a position about 3 miles westward of Haining. After being refloated by the following flood current, these craft then follow the northern shore to a safe position just eastward of Hangchow.

Native craft shelter in Bore Shelter Bay and then off Haining in proceeding to Hangchow from Chapu Roadstead: the journey takes 3 days.

Boats leave Hangchow immediately after the bore has passed and secure off Haining; after the next high water, they proceed to Bore Shelter Bay, and at the next high water proceed to Chapu Roadstead.

Navigation between Bore Shelter Bay and Chapu Roadstead is not safe in strong winds because of violent overfalls. Boats should not start at night except with a pilot.

Tides.—The mean high water interval at Haining is 2 h. 12 m.; the mean range is 15.5 feet, and the spring range is 19.1 feet.

Bore of the Tsientang Kiang.—At full and change of the moon the bore of the Tsientang Kiang originates between 10h. 00m. and 10h. 30m. in the vicinity of the meridian of Tachi San (Chi San), a conspicuous hill 12 miles east-southeastward of Haining, and on a still night it can be heard at Haining half an hour after its formation. The bore is composed of two branches; the main and higher branch keeps along the shore, touching the sea wall with its northern extremity and the sands with its southern extremity; the other branch appears at Haining from the southeastward, touching the sand on both sides.

About 4 miles from Haining the branches join, the southern extremity of the first with the northern extremity of the second, making a continuous white line 2 miles in length. Shortly afterwards the bore commences to contract in width, increase in speed, and rise in height, conforming to the shores of the river. About 2 miles from

Haining the flood current, probably that from the southeastward, which runs through the other, charges into the sea wall. There is no particular effect at the wall itself, but a violent rebound causes a tumultuous rising of the waters in waves several hundred yards behind, and twice as high again as the front of the bore. These waves exist for many minutes, traveling southward or southwestward, and subside onto the back of the bore. Usually, as the moon crosses the meridian, the bore passes Haining, where it is nearly a straight line across the river, 1,800 yards wide, 8 to 11 feet high, and traveling 12 to 13 knots, its front being a uniform sloping cascade of bubbling foam, falling forward and pounding on itself and on the river before it at an angle of between 40° and 70° . The highest and steepest part is over the deeper channel of the river.

The northern end of the bore swells up to the sea wall as it passes along, but the southern end, meeting an incline of sand which only rises 19 feet in 1.4 miles, trails away in a tapering wall of breakers, which terminate $\frac{1}{2}$ mile in the rear of the bore, or where it passed 3 or 4 minutes previously. The river fills up to the level of the bore soon after it passes, but not evenly. The height, speed, and regular appearance of the front are maintained for 15 miles above Haining, after which the height decreases, and the bore passes Hangchow at 13h. 45m.; soon after it breaks up and disappears.

About $\frac{1}{4}$ hour after the bore has passed Haining the water has risen 13 feet; at 2 hours it has risen 18 feet; it is high water at 3 hours, when the tide has reached a height of 19 feet, and the current at once commences to run out swiftly. At 5 hours it is at the mean level; at 8 hours it is nearly low water. The outgoing current, however, continues to run rapidly eastward until the arrival of the next bore. The water is at its lowest for the 2 hours preceding the bore.

It is high water at Hangchow about the same time as at Haining, but the rise and fall does not exceed 6 or 7 feet.

At Haining the flood lasts for 3 hours, the ebb for 9 hours. At Hangchow the flood continues for $1\frac{1}{4}$ hours and is nearly all in the bore.

There is no place in the river where boats can be secured in safety $2\frac{1}{2}$ hours after high water. All traffic between Haining and Hangchow begins soon after the bore has passed and ends 2 hours after high water, a period of 3 to 4 hours.

On the northern bank of the Tsientang Kiang the current—at any rate for 5 or 6 miles inside the mouth of the river—commences to run out strongly 1 hour before high water at Haining.

The bore abreast Hangchow, if it occurs at all, is not regarded in any way dangerous for 15 or 20 days in the month. At Haining

the natives state that it comes with every flood tide, but that in calm weather and neaps it is only 2 or 3 feet high.

The bore is probably always dangerous on account of its speed, and at springs it is formidable. Navigation for ships is impossible.

When the moon is in perigee at full or change, or when there are strong northerly or easterly winds in the Chusan Archipelago, the bore generally arrives early off Haining, travels at a greater speed than usual, and is also higher.

Hangchow ($30^{\circ}16' N.$, $120^{\circ}09' E.$, *H. O. Chart 5495*) lies on the northern bank of the Tsientang Kiang about 20 miles within the entrance. Hangchow is the capital of the province of Chekiang, and is more important politically than commercially; a large portion of the products brought to the city are transhipped by rail and canal to Shanghai. The southern terminus of the Grand Canal is in Hangchow.

In 1937 the population of Hangchow was about 730,000.

Hangchow is in communication with Shanghai and Ningpo by railroad. The city is connected with the general telegraph system. There are two mission hospitals.

CHAPTER VI

NIMROD SOUND TO MIN RIVER

NIMROD SOUND (SIANGSHAN KIANG) (*H. O. Chart 2171*) is an inlet extending about 27 miles southwestward from an entrance between Sail Rock and Hunter Point. For a distance of about 11 miles within the entrance the inlet is nearly free of dangers, and this outer portion is at least $1\frac{1}{2}$ miles wide. The depths are 5 to 10 fathoms. Several anchorages are available; vessels often take refuge from a typhoon within Nimrod Sound. The inner portion of the inlet is encumbered with islets and rocks.

Entrance.—Sail Rock ($29^{\circ}42' N.$, $121^{\circ}52' E.$, *H. O. Chart 2171*) is a vertical, square rock, 24 feet high. It lies about 1 mile off the coast on the edge of a drying flat. The entrance to the Tasung Kiang is about $1\frac{1}{2}$ miles southwestward of Sail Rock.

The Chumung Islets and several rocks lie off Hunter Point, the southeastern point of the entrance to Nimrod Sound. Hunter Point is about 4 miles southeastward of Sail Rock. About 1 mile northeastward of the point is a light-colored islet, **East Chumung**. This islet has a precipitous eastern side, and is 195 feet high; it is the highest and most conspicuous of the Chumung Islets. On its summit is a triangular framework **beacon**. Pearl Rock, the northernmost rock off Hunter Point, is 18 feet high; it lies about $1\frac{1}{4}$ miles northward of the point. A sunken wreck, dangerous to navigation, lies about 4 miles eastward of Pearl Rock.

Fishing stakes were observed in 1934 extending between the Chumung Islets and the Tasung Kiang entrance.

Anchorage off Hunter Point.—Vessels can anchor off Hunter Point; the depths in a position with Hunter Point bearing 80° , and 1 to 2 miles distant, are $3\frac{1}{2}$ to $4\frac{1}{2}$ fathoms.

Northern side of Nimrod Sound.—Barren Point is about 6 miles southwestward of Sail Rock; Barren Islet lies about $\frac{1}{2}$ mile northeastward of the point.

The two Nimrod Islets, 150 feet high and 239 feet high, respectively, lie close off the northern shore of the sound. Square Point is the eastern extremity of the eastern and smaller of the Nimrod Islets; the point is about $1\frac{3}{4}$ miles south-southwestward of Barren Point. A bank, with a least depth of 3 fathoms, extends from the intervening coast as far as a line joining Square Point and Barren Point.

Tasung Point is about $3\frac{1}{2}$ miles southwestward of Square Point.

Tasung Point is the western point of the entrance to a shallow bay with a village at its head. The limit of the clear, deep outer portion of Nimrod Sound is near Tasung Point.

Parker Island, attaining a height of 626 feet in its south central portion, lies with its eastern extremity about $1\frac{1}{2}$ miles south-southwestward of Tasung Point. The Danger Rocks lie 800 yards eastward and 700 yards southeastward, respectively, of the eastern extremity of Parker Island; both rocks dry. The narrow channel between Parker Island and the mainland has depths of 5 to 7 fathoms.

The eastern Entrance Islet is 187 feet high, and lies about $\frac{1}{2}$ mile southwestward of Parker Island. The smaller Entrance Islet is close westward of the other. In 1933 fishing stakes extended from the southern shore of Nimrod Sound to a position 1 mile southward of the western Entrance Islet.

The six Treble Islands extend about 2 miles in a southwesterly direction from a position about $2\frac{3}{4}$ miles southwestward of the western Entrance Islet. Deepwater Point is the northern extremity of Big (East) Treble Island, the northeasternmost of the group. Between the southeastern side of this island and the southern shore of Nimrod Sound the depths are not more than 3 fathoms.

Morris Island lies close off the northern shore off Nimrod Sound in a position about $1\frac{3}{4}$ miles north-northeastward of Deepwater Point. Harlequin Island lies with its southeastern extremity about $\frac{3}{4}$ mile northwestward of Deepwater Point. Half-tide Rock is about 600 yards eastward of the southern extremity of Harlequin Island. Eel Islet, 75 feet high, lies about $1\frac{1}{2}$ miles south-southwestward of the southern extremity of Harlequin Island.

Anchorage.—In 1934 a British naval vessel anchored between the western Entrance Islet and Deepwater Point. This landlocked anchorage is recommended as a typhoon refuge.

Small vessels with local knowledge can anchor southward of the Treble Islands out of the strength of the tidal currents; westward of the 3-fathom depths between Big Treble Island and the southern shore of the sound are depths of 5 fathoms.

The depths in an anchorage about 800 yards east-southeastward of Morris Island are 5 fathoms; the position is sheltered.

The holding ground is good in an anchorage northward of Eel Islet; the depths are $4\frac{1}{2}$ to $5\frac{1}{2}$ fathoms.

Southern side of Nimrod Sound.—Cone Point lies about 4 miles west-southwestward of Hunter Point. Cone Rock, 18 feet high, is about 1,200 yards northward of Cone Point. David Islet is about $\frac{1}{2}$ mile westward of the point. A rock lies 400 yards north-northeastward of the islet, and another lies 1 mile westward of the islet; the depths over the rocks are 1 fathom and $2\frac{1}{4}$ fathoms, respectively.

Nimrod Point, about $1\frac{1}{2}$ miles west-southwestward of David Islet, has on it a hill 305 feet high. Dragon Point lies about $3\frac{3}{4}$ miles

southwestward of Nimrod Point; along the intervening coast are Boat Point, Rock Point, and Fisherman Point. Middle Islet, about 40 feet high, is in midchannel in a position about $1\frac{1}{4}$ miles northward of Dragon Point.

Round Point, the eastern point of the entrance to Medusa Creek, is about $\frac{3}{4}$ mile southward of Dragon Point; the western point of the entrance, Medusa Point, is about $\frac{3}{4}$ mile west-southwestward of Dragon Point.

Medusa Creek trends eastward about 2 miles; the narrow deep channel then opens into a shoal basin. A $2\frac{1}{4}$ -fathom patch lies in the entrance to the creek about midway between Round Point and Medusa Point. **Anchorage** can be taken in Medusa Creek about 600 yards off the northern shore in a position about $1\frac{1}{4}$ miles eastward of Round Point. The depths are 10 fathoms. Boats can land on the northern shore abreast the anchorage.

The southern shore of Nimrod Sound is hilly between Medusa Point and Adam Point, about $3\frac{1}{4}$ miles southwestward. A 3-fathom patch lies about $\frac{1}{2}$ mile westward of Adam Point.

The head of Nimrod Sound consists of two bays nearly filled with drying flats. Zuzukeu Bay lies westward and southwestward of Hewett Point; Ninghai Bay lies westward and southwestward of Bight Point. Hewett Point is on the northern shore of Nimrod Sound in a position about $2\frac{1}{4}$ miles west-northwestward of Eel Islet. Bight Point is on the southern shore of the sound about $3\frac{1}{2}$ miles southeastward of Hewett Point. Pisani Rock, over which the depth is $1\frac{1}{2}$ fathoms, is about $1\frac{1}{4}$ miles east-southeastward of Hewett Point. Midway Reef, about $\frac{1}{2}$ mile south-southeastward of the point, dries.

Tidal currents.—The tidal current sets into Nimrod Sound from a few minutes after low water until a few minutes after high water; the out-going current runs from a few minutes after high water until a few minutes after low water. At spring tides the maximum rate of the current at the entrance is 3 knots; at the anchorage northward of Eel Islet the maximum rate is 4 knots. The tidal currents are also strong in the channel southward of Parker Island.

NUPI SHAN CHANNEL (*H. O. Charts 2171 and 3212*) trends generally northwestward from abreast the Kue Shan Islands to connect with the inshore route to the Yangtze River estuary. The Kue Shan Islands and the Me Shan Islands are on the eastern side of the channel; on the western side are a number of islets and dangers close off the mainland coast southward of Hunter Point. Roberts Pass, Gough Pass, and Duffield Pass connect Nupi Shan Channel with Fatu Channel. Nupi Shan Channel also connects with Nimrod Sound.

Navigation.—Nupi Shan Channel is available to vessels drawing

not more than 20 feet. It is a convenient passage in winter, when the prevailing winds are northerly, and typhoons are rare.

Vessels drawing more than 16 feet should not proceed through Nupi Shan Channel when a typhoon is in the offing and a high easterly swell is setting up the coast. The swell, an infallible mark of an approaching typhoon, occasionally rises 8 feet above mean sea level, so that in places there may be depths of only $3\frac{3}{4}$ fathoms.

Western side of Nupi Shan Channel.—The coast on the western side of Nupi Shan Channel trends generally southward for a distance of 24 miles to the Bangao Islands. This coast is mountainous and rugged; the extensive plains between the mountains are cultivated. This section is thickly populated. The indentations in the coast are encumbered with mud flats from which rise numerous islets and rocks. The depths as far as 4 miles off the various points along the coast are less than 3 fathoms; there are few landing places. The sea is discolored by mud; under-water dangers cannot be seen.

Daimuk (Bear Island) ($29^{\circ}25' N.$, $122^{\circ}00' E.$, *H. O. Chart 2171*) is near the outer extremity of Nupi Shan Channel. The island is 500 feet high, and is precipitous and dark-colored. The outermost of three rocks lying within a distance of $\frac{1}{2}$ mile northeastward of the island is 17 feet high.

Mount Thornton, a mainland peak 1,467 feet high, is near the coast in a position about 4 miles northwestward of Daimuk. A walled coastal town, Jackji, is about $1\frac{1}{4}$ miles northward of Mount Thornton.

Morore, an islet 400 feet high, lies $\frac{1}{2}$ mile off the coast eastward of Jackji. An islet 158 feet high is close eastward of Morore. Chingming, an island 389 feet high in its southwestern portion, is the largest of a compact group of islands and rocks about 2 miles northward of Morore.

Yangi, an islet 313 feet high, lies about $2\frac{3}{4}$ miles northward of Chingming. A $2\frac{1}{2}$ -mile section of the coast northeastward from abreast Yangi is fringed by numerous islets and rocks. On an islet 46 feet high abreast the northeastern end of this section is a stone tower from which an occasional light, privately maintained, is exhibited. (See Light List.)

Needle Peak, a mainland summit 1,770 feet high, is about $4\frac{1}{4}$ miles west-northwestward of Yangi, and is sharp and conspicuous.

Nupi Shan Island lies with its southern extremity about $3\frac{1}{2}$ miles north-northeastward of the northeastern extremity of Yangi. The eastern side of the island is precipitous; the western side is deeply indented. The island is light-colored. Buffalo Nose, the northeastern extremity of Nupi Shan Island, is perforated. A bank, with depths less than 3 fathoms, extends about 1 mile southeastward from the southeastern side of the island; a rock 38 feet high lies on the northern part of this bank in a position about 800 yards southeastward

of Buffalo Nose. A rock 78 feet high lies about 300 yards off the northwestern extremity of Nupi Shan Island; a shoal, with a depth of 2 fathoms, extends about 400 yards from the western side of this rock.

The Ploughman, an island nearly 1 mile westward of the northwestern extremity of Nupi Shan Island, is rocky and precipitous. The island is covered with grass and has a flat summit about 388 feet high. A bank, with depths less than 3 fathoms, extends about 1 mile northwestward from the northwestern side of The Ploughman; Lokyu, an islet 148 feet high, and a smaller islet lie on the western edge of this bank. A conspicuous rock, 6 feet high, lies about $\frac{1}{2}$ mile eastward of the northern extremity of Lokyu. Tunic Island, 170 feet high, is close off the coast in a position about $1\frac{1}{2}$ miles westward of Lokyu.

Eastern side of Nupi Shan Channel.—The Kue Shan Islands lie on the eastern side of the southern entrance to Nupi Shan Channel. Kilungyu (Patahekok) ($29^{\circ}23' N.$, $122^{\circ}13' E.$, *H. O. Chart 2171*) is the south-easternmost and most remarkable island in the group. It is precipitous on its southern and eastern sides, and has a well-defined summit over 500 feet high. A rock lies off the southern extremity of Kilungyu; a sharp-pinnacle rock 15 feet high lies between the extremity and the rock. An islet, 105 feet high, is about $\frac{1}{4}$ mile off the eastern extremity of Kilungyu; the intervening channel is foul. An islet, 57 feet high, is about $\frac{1}{4}$ mile northwestward of Kilungyu. An islet, 140 feet high, is about $1\frac{1}{4}$ miles northwestward of the island; two small islets are close westward of the 140-foot island. Twist Islet, 134 feet high, lies about $1\frac{3}{4}$ miles westward of Kilungyu.



Kilungyu (Patahekok) bearing 273° , distant 2 miles

Daiching, an islet nearly 3 miles northwestward of Kilungyu, is 488 feet high; a rock drying 13 feet is about $\frac{1}{4}$ mile off the southern side of Daiching. Oliver Rocks, two rocks awash, lie within a distance of $\frac{3}{4}$ mile from the southern side of the island. Holderness Rocks, two rocky heads with depths of less than 6 feet over them, lie close together over $\frac{1}{2}$ mile westward of the western extremity of Daiching.

Daiwan Island, the largest of the Kue Shan Islands, lies northward of Daiching; the depths in the narrow intervening channel are 7 fathoms. A village is near the narrow isthmus that connects the southwestern part of Daiwan Island with the northeastern part. The

highest peak on Daiwan Island, 543 feet high, is about in the center of the southwestern part of the island. A bank, with a depth of less than 3 fathoms, extends about $1\frac{1}{4}$ miles northwestward from the northwestern side of the island. An islet, 110 feet high, is close westward of the southwestern portion of Daiwan Island; in 1939 fishing stakes were observed extending about 800 yards westward from this islet.

Kunsuwan, the northwesternmost of the Kue Shan Islands, lies northwestward of the northeastern part of Daiwan Island. The highest peak on Kunsuwan, 334 feet high, is in the southwestern part of the island. The intervening channel is about $1\frac{1}{4}$ miles wide; within this channel is Observatory Hill, an islet 78 feet high. The islet is close off the southeastern side of Kunsuwan, and is connected with the latter at low water. Zongmung, an islet 197 feet high, is also within this channel. A group of islets and rocks extending as far as $3\frac{1}{2}$ miles eastward from Kunsuwan terminates in Chitkuk, an islet 282 feet high; the sharp summit of this islet is a useful mark to vessels passing eastward of the Kue Shan Islands.

Shu Shan (Mouse Islet), a black rock 14 feet high, lies about $6\frac{1}{2}$ miles north-northwestward of Chitkuk. A rock drying 8 feet lies close northwestward of Shu Shan.

Anchorage.—Vessels with local knowledge can anchor off the southwestern side of Kunsuwan about 400 yards offshore in a position with Observatory Hill bearing 77° and just open southward of the southern extremity of Kunsuwan. In this position the summit of the latter island bears 357° . The depths are 5 fathoms, and the bottom is mud. Vessels in this anchorage are sheltered from winds between north-northeast and south, through east.

Tidal currents.—The tidal currents in the vicinity of the Kue Shan Islands are rotary. The first half of the flood tide sets between south and west, and the last half between west and north. The first half of the ebb sets between north and east, and the last half between east and south. The currents attain rates of 1 to 3 knots according to the age of the moon.

Between a position about 10 miles eastward of the group and Tongting (p. 340), about 30 miles northeastward, the tidal currents set southward when the flood commences at the Kue Shan Islands; they then change through southwest to west. When the ebb tide commences at the Kue Shan Islands the current first sets north-westward, then changes through north and east to south. The rates are from $\frac{1}{2}$ to $2\frac{1}{2}$ knots.

The Me Shan Islands lie north-northwestward of the Kue Shan Islands. Me Shan ($29^\circ 37' N.$, $122^\circ 09' E.$, *H. O. Chart 3212*), the largest and highest island of the group, lies about 5 miles northwestward of Shu Shan, and attains a height of 511 feet in a sharp summit

in its northern part. Me Shan is light colored, and is covered with grass its eastern side is precipitous. A ridge of rocks extends about $\frac{1}{4}$ mile from the southern side of the island; a bank, with a depth of less than 3 fathoms, extends over $\frac{3}{4}$ mile from the western side. Two islets, each 136 feet high, lie close together within a distance of 1 mile southeastward of Me Shan. Fishing stakes were observed in 1933 extending from the southeasternmost islet of the Me Shan group in a northeasterly direction nearly to Mun dun Shan.

The Tinker is a black, rugged islet, 68 feet high, lying about $\frac{1}{2}$ mile south-southwestward of Me Shan. A pinnacle rock, with a depth of 1 foot over it, lies about $\frac{1}{2}$ mile east-southeastward of The Tinker; the sea seldom breaks over the pinnacle rock. A bank, over which the depth is 5 fathoms, lies about 2 miles southeastward of The Tinker.

Lanyett, an islet 172 feet high, lies about $\frac{3}{4}$ mile northwestward of the northwestern extremity of Me Shan. An islet 320 feet high lies close southwestward of Lanyett. A bank, with depths less than 3 fathoms, extends nearly $2\frac{1}{2}$ miles northwestward from these two islets; several rocks rise from this bank.

Lu Wang (for additional description see p. 344) is an island lying northward of the Me Shan Islands; the intervening channel is about 1 mile wide, and has depths of 6 to 14 fathoms in the fairway. Castle Rock, 49 feet high, lies in the eastern part of this channel in a position about $1\frac{3}{4}$ miles east-northeastward of Lanyett. A rock, over which the depth is 6 feet, lies in the northwestern part of the channel in a position about $2\frac{1}{2}$ miles northwestward of the same islet. The southwestern coast of Lu Wang is rugged; the numerous bays indenting this coast are almost completely filled with drying mud flats.

Flake Island, 135 feet high, lies about $1\frac{1}{4}$ miles east-southeastward of Clarence Point, the southwestern extremity of Lu Wang. A spit, with general depths of less than 3 fathoms, extends about 3 miles southeastward from Flake Island; near the outer end of this spit are the Reef Islands. These islands, 178 and 196 feet high, respectively, lie close together, and are connected to each other at low water. Fishing stakes were reported in 1934 extending nearly 2 miles in a south-southwesterly direction from a position about $\frac{3}{4}$ mile southward of Flake Island; in 1937 numerous fishing stakes and floats were observed in mid-channel between the Reef Islands and Nupi Shan Island, on the western side of Nupi Shan Channel.

Anchorage.—Good anchorage can be had in positions southward of Flake Island and westward of the Reef Islands. The depths are 5 to 7 fathoms, and there is shelter from northwestward through north and east to east-southeastward.

In fine weather there is anchorage anywhere between Lu Wang and Nimrod Sound.

Tidal currents.—The tidal currents in the anchorage southward

of Flake Island and eastward of the Reef Islands set northwestward from 3½ hours before until 2½ hours after high water, and south-eastward from 2½ hours after high water until 3½ hours before the next high water. The currents attain rates of 1 to 3 knots according to the age of the moon.

Dangers in Nupi Shan Channel.—Pylades Rock (Porzor) (29°28' N., 122°03' E., *H. O. Chart 2171*) is on the western side of the fairway through Nupi Shan Channel in a position about 3½ miles northeastward of Daimuk. The sea breaks over this rock only at low water, except when there is a heavy swell.

The Whelps (Sizor) are four rocky islets also on the western side of the fairway. The southernmost and highest islet is 90 feet high, and lies nearly 5 miles eastward of Chingming. Another islet of the group is close northward of this islet; the other two islets lie close together about ½ mile to the north-northwestward.

The Corkers are also on the western side of the fairway through Nupi Shan Channel. The group, consisting of 10 islets and several rocks, rises from general depths of 3½ to 4¾ fathoms. Hongyangzor, the southwesternmost islet, lies about 3½ miles northwestward of The Whelps; this islet is 110 feet high, and has precipitous sides. Two rocks above water lie close off its southeastern extremity. The southeasternmost islet of the group, nearly 1¾ miles eastward of Hongyangzor, is 52 feet high; a rock awash lies about 200 yards eastward of it. A rock, with a depth of 6 feet over it, lies about 1,200 yards southward of the 52-foot islet; about 400 yards westward of this rock is another over which the depth is 5 feet. The northeasternmost rock of The Corkers is about 1½ miles northward of the 52-foot southeasternmost islet; this rock is 9 feet high, and there are rocks awash at high water close eastward of it.

Starboard Jack, on the eastern side of the fairway through Nupi Shan Channel, is about 1¾ miles south-southeastward of The Tinker. Starboard Jack is a rugged, black rock 30 feet high. A rock drying 6 feet lies about 400 yards eastward of Starboard Jack; a rock two feet high lies about 200 yards northward of Starboard Jack.

Caution.—In 1934 depths of fully 1 fathom less than charted were found in the northern part of Nupi Shan Channel between a position about 3 miles northeastward of Nupi Shan Island and a position about the same distance northwestward of the island.

Fishing stakes are usually to be found in large numbers in the channel.

A sunken wreck, dangerous to navigation, lies about 3 miles northwestward of Buffalo Nose, the northwestern extremity of Nupi Shan Island.

NORTHERN APPROACH TO SHIHPU HARBOR. (*H. O. Chart 3180*).—The coast from a position abreast Daimuk to the penin-

sula enclosing Shihpu Harbor, about 12 miles southward, is very irregular. The extensive bays are nearly filled with drying flats. The 3-fathom curve lies from 3 to 5 miles offshore; the majority of the off-lying islands lie within this curve.

Coast.—A point on the mainland abreast Daimuk (29°25' N., 122°00' E., *H. O. Chart 2171*) rises to a height of 210 feet. Yangi, an islet 214 feet high, lies close off this point.

The coast is indented between the point abreast Daimuk and Dan men, a point about 4¾ miles southward; the bay is filled by a drying flat. Bug gu, an islet 187 feet high, lies on the edge of this flat.

Off-lying islands.—Shang san (*H. O. Chart 3180*), a hilly islet 458 feet high, lies less than 1 mile eastward of Dan men. An islet and a rock above water are in the intervening channel. A rock, 37 feet high, and a rock 20 feet high are about ½ mile and ¾ mile, respectively, north-northeastward of the northeastern extremity of Shang san.

Bu dei, an islet slightly more than 1 mile eastward of Shang san, has a sharp summit 307 feet high. An islet lies close off the western extremity of Bu dei and another lies close off the eastern extremity. An islet and some rocks lie within a distance of 1,600 yards northward and north-northeastward of the islet off the eastern extremity of Bu dei. The wreck of a large junk, visible above water, lies about 2 miles south-southeastward of Bu dei.

Ping feng shan, an islet 290 feet high, lies nearly 3 miles southward of Bu dei. Yueh yu shan is an islet about 1 mile west-southwestward of Ping feng shan.

Coast.—Yueh yu shan is close off the northern extremity of a hilly promontory. This promontory attains a height of 226 feet in a hill lying about 2 miles south-southwestward of Ping feng shan.

The coast between Dan men and this promontory is indented by a bay filled by a drying mud flat. Several islets and rocks are on this flat.

The coast southward of this promontory is also indented by a bay. The southern point of the entrance to this bay, nearly 3 miles southward of the 226-foot hill, is on the northern side of the northern entrance to Shihpu Harbor.

Off-lying islands and dangers.—The Cliff Islets are a compact group of three islets and a number of rocks. The northernmost and highest of the Cliff Islets is 153 feet high, and lies about 1¼ miles southeastward of Ping feng shan. A rock drying 2 feet lies about 1 mile northeastward of this islet. The southernmost Cliff Islet lies about ¾ mile southeastward of the northernmost. An islet 142 feet high lies about 1 mile southward of the southernmost Cliff Islet.

Half-tide Rock, drying 14 feet, lies about 5 miles eastward of the central Cliff Islet. When covered this rock is not readily seen when the sea is smooth.

The easternmost and highest of the three Bangao Islets is 561 feet high, and lies about $3\frac{1}{2}$ miles south-southwestward of the central Cliff Islet. Wang chi, the middle Bangao Islet, is 433 feet high, and lies close southwestward of the easternmost islet. The smallest and lowest Bangao Islet, 230 feet high, is close northwestward of Wang chi.

Bangao Rock, awash at high water, lies about $\frac{1}{4}$ mile southward of the easternmost Bangao Islet.

San tau san (Gore Island) ($29^{\circ}12' N.$, $122^{\circ}02' E.$, *H. O. Chart 3180*) lies with its northwestern extremity about 2 miles southeastward of the summit of the easternmost Bangao Islet. The channel between Bangao Rock and this extremity of San tau san is about $1\frac{1}{4}$ miles wide, and has a least depth of $2\frac{3}{4}$ fathoms. San tau san is 625 feet high in a peak near the middle of the western shore.

Tan tau san (Montague Island) lies southward of San tau san and is connected to the latter island by a low shingle isthmus. The highest of several peaks on Tan tau san is near the eastern extremity, and is 732 feet high.

Several islets lie off the eastern and northeastern coasts of San tau san. The easternmost lies about $1\frac{3}{4}$ miles northeastward of the eastern extremity of the island; another islet lies about $\frac{1}{2}$ mile westward of the easternmost islet. Three islets, almost connected with each other, lie within a distance of 1,200 yards northeastward of the northeastern extremity of San tau san; the southernmost and highest is 232 feet high. A drying reef lies close eastward of the middle islet. An islet 124 feet high lies nearly 1 mile north-northeastward of the northeastern extremity of San tau san.

Southern approach to Shihpu Harbor (*H. O. Chart 3180*).—Niu tiu Island lies with its northeastern extremity about $1\frac{1}{2}$ miles west-southwestward of the southwestern extremity of Tan tau san. The island is about $5\frac{1}{2}$ miles wide in an east and west direction, and about $7\frac{3}{4}$ miles long from its northern extremity to its southern extremity; Cape Conway is a short distance east-northeastward of the southern extremity of the island. A peak 1,176 feet high is near the northeastern extremity, and another peak, 1,284 feet high, is about 1 mile southward of the 1,176-foot peak.

The eastern and larger of The Twins, about 140 feet high, lies about $3\frac{3}{4}$ miles east-southeastward of Cape Conway; the western and smaller islet, 80 feet high, is about $\frac{1}{2}$ mile westward of the other. In the channel between the islets are several sunken rocks.

Medusa Rock, on the western side of the southern approach to Shihpu Harbor, lies nearly 3 miles eastward of Cape Conway. Medusa Rock is over 130 feet high.

Nose Islet, 138 feet high, lies close off the eastern shore of Niu tiu Island in a position about $2\frac{1}{4}$ miles north-northeastward of Cape Con-

way. Foul ground extends eastward and southeastward from Nose Islet to a distance of about $\frac{1}{4}$ mile.

Ellis Islet, nearly 3 miles east-northeastward of Nose Islet, is 106 feet high. Foul ground extends over $\frac{1}{4}$ mile northwestward from Ellis Islet. The depths in the channel between Ellis Islet and Nose Islet are $4\frac{1}{4}$ to 5 fathoms.

Yi lu (Startle Islet), about $1\frac{1}{4}$ miles north-northeastward of Ellis Islet, appears as two islets from a short distance; the northern portion is 160 feet high, and the southern portion is 86 feet high.

Shihpu Road lies between the southwestern shore of Tan tau san and the northern part of the eastern shore of Niu tiu Island. Vessels can anchor in Shihpu Road. The depths are $3\frac{1}{2}$ to $5\frac{1}{2}$ fathoms, and the bottom is mud. There is usually a heavy swell in Shihpu Road, and the tidal currents may attain a rate of $2\frac{1}{2}$ knots; the desirability of this anchorage is reduced accordingly.

*Several islets lie westward of San tau san in the southern approach to Shihpu Harbor. Ching shu (Cliff Island) is about 2 miles southwestward of the northern extremity of San tau san. Ching shu consists of two portions joined by a reef; the highest point is 84 feet high. Two rocks awash lie eastward of Ching shu. Da wu is an islet lying less than $\frac{1}{2}$ mile southward of Ching shu. An island, 102 feet high, lies about $\frac{1}{4}$ mile westward of Ching shu, and has a rock drying 9 feet close off its southwestern extremity. The least depth in the fairway westward of the 102-foot island is $2\frac{1}{4}$ fathoms.

SHIPHU HARBOR ($29^{\circ}12' N.$, $121^{\circ}57' E.$, *H. O. Chart 3180*).—

Shihpu Harbor is an extensive area between the mainland to the northward and Niu tiu Island, and islands westward of the latter, to the southward. Within the entrances the harbor extends southwestward for about 4 miles and then westward for about 3 miles. Several islands lie within Shihpu Harbor.

The harbor is landlocked and affords excellent protection.

Depths.—The northern entrance channel is deep in the fairway; there is a least depth of $2\frac{1}{4}$ fathoms in the approach.

The southern entrance channel is also deep in the fairway; the least depth in the approach is $3\frac{1}{2}$ fathoms.

Vessels up to 300 feet long can secure good anchorage in Shihpu Harbor.

Entrance channels.—Tungmun Island and Tai mun (Sin) Island lie in the entrance to Shihpu Harbor. These two islands are separated by a narrow, unnavigable channel. A privately maintained light (see Light List) is shown from a white stone tower, 30 feet high, on the southeastern extremity of Tungmun Island. Hsia wan men, the southern entrance channel, trends northwestward between the northeastern side of Niu tiu Island and the southwestern side of Tai mun Island. Tung wan men, the northern entrance channel, trends north-

westward, westward, and southward between Tungmun Island and the mainland. Hsia wan men is the recommended channel for deep-draft vessels. Vessels drawing more than 14 feet are advised not to proceed through Tung wan men.

The southern point of the entrance to Hsia wan men is slightly more than $1\frac{1}{4}$ miles westward of the southwestern extremity of Tan tau san. Foul ground, with some islets on it, extends nearly $\frac{3}{4}$ mile northeastward from this entrance point; the largest islet is 93 feet high. The fairway into Hsia wan men inclines toward the southwestern side of Tai mun Island and bends sharply around this foul ground. Hsia wan men is 200 yards wide at its narrowest part. At the northwestern end of the channel are two islets with a deep channel between them. The channel between the western islet and the northern extremity of Niu tiu Island is also deep. A rock above water lies about $\frac{1}{2}$ mile southwestward of the western extremity of the western islet and about 200 yards off the northern shore of Niu tiu Island.

Tung wan men, the northern entrance channel, is narrower and more tortuous than Hsia wan men, but is freely used by junks. The fairway is deep. The entrance to Tung wan men, between the northeastern extremity of Tungmun Island and the mainland, is about 100 yards wide. Immediately within the entrance the channel widens abruptly and forms a basin. This basin is encumbered by islets and shoals; the fairway trends along the northern shore of Tungmun Island and is about 300 yards wide. Off the northwestern extremity of Tungmun Island the fairway turns sharply southward, and is 300 to 400 yards wide between shoals on either side.

Inner harbor.—An island, 351 feet high, lies with its eastern extremity about $2\frac{1}{4}$ miles west-southwestward of the northern extremity of Niu tiu Island. The island is about $1\frac{1}{4}$ miles long in an east and west direction, and is slightly over $\frac{1}{4}$ mile wide. Foul ground extends about $\frac{1}{2}$ mile north-northeastward from the eastern extremity of the island.

This island divides the inner harbor into a deep portion to the northeastward and a deep portion to the westward. A least depth of $3\frac{1}{2}$ fathoms can be carried in the channel northward of the island; the southwestern end of the channel deepens to as much as 25 fathoms. The channel southward of the island has a least depth of $2\frac{1}{4}$ fathoms in the fairway. An islet, 66 feet high, lies on a bank in the middle of the entrance to this channel in a position about $\frac{1}{4}$ mile eastward of the eastern extremity of the 351-foot island; the channel between the 351-foot island and the 66-foot islet is deep. The channel southward of the 66-foot island is obstructed by shoals.

On the southern side of the harbor in a position about $1\frac{1}{4}$ miles southwestward of the southwestern extremity of the 351-foot island is the entrance to a narrow channel connecting Shihpu Harbor with

San mun Bay along the western side of Niu tiu Island. The depths in the northern end of this channel are 4 fathoms or more, but in the southern approach to this channel the depths are not more than 4 feet.

About $3\frac{1}{4}$ miles west-southwestward of the western extremity of the 351-foot island are two islets with deep but narrow channels between them, and also northward and southward of them. The northern islet is San men wan, and on its western end are a white dwelling and a white tower from which a privately maintained light (see Light List) is shown.

The head of Shihpu Harbor has depths of over 5 fathoms for a distance of about $1\frac{1}{2}$ miles above San men wan, and then shoals gradually.

SHIPHU ($29^{\circ}13' N.$, $121^{\circ}57' E.$, *H. O. Chart 3180*).—The town of Shihpu lies westward of Tungmun Island on the western side of Tung wan men.

Pontoons.—Three pontoons, connected to the shore by bridges, have a total frontage of 231 feet; the depths alongside are 40 feet.

Supplies.—Drinking water can be obtained. It is brought in sampans to ships at anchor.

Fuel oil, from limited stocks maintained by large oil companies, is available. Small quantities of stores and supplies are procurable.

Communications.—Shihpu is in communication by steamer with Shanghai, Wenchow, Ningpo, and Taichow.

There is long distance telephone service between Shihpu and Shanghai, and between Shihpu and other towns in the province of Chekiang.

Hospitals.—There are three small general hospitals in Shihpu.

SAN MUN BAY (*H. O. Chart 3180*) is a large indentation entered between Cape Conway, near the southern extremity of Niu tiu Island, and a point about 14 miles west-southwestward. The bay is encumbered with many islets and dangers. The Ninghai River and the Hae yu River flow into the shoal head of San mun Bay.

Islands and dangers in San mun Bay.—Heroine Rock ($29^{\circ}01' N.$, $121^{\circ}59' E.$, *H. O. Chart 3180*) lies about $3\frac{1}{2}$ miles south-south-eastward of Cape Conway. The rock dries 4 feet.

Lea ming Island, 506 feet high, lies close off the southern extremity of Niu tiu Island. Sanchesan (Triple Islet), about $2\frac{1}{2}$ miles southwestward of Lea ming Island, is divided into three parts; the northernmost part is 84 feet high. In the channel between Lea ming Island and Sanchesan the depths are 6 to 9 fathoms.

The largest of the San mun Islets is 181 feet high, and lies nearly $5\frac{3}{4}$ miles west-southwestward of Sanchesan. There are several islets, with foul ground between them, in this compact group. In the channel between Sanchesan and the San mun Islets the depths are $4\frac{1}{4}$ to $6\frac{3}{4}$ fathoms.

A chain of islets and rocks extends nearly 3 miles northwestward from the San mun Islets. The Wu tzu tao Islets are a group at the end of this chain; the largest and highest of the Wu tzu tao Islets is 276 feet high. The channel between this chain and the mainland to the southwestward has depths of $3\frac{1}{4}$ to 4 fathoms in the fairway.

Ping chiao, a rock 4 feet high and surrounded by a reef, is in the

northwestern part of this channel in a position about $1\frac{1}{2}$ miles westward of the largest of the Wu tzu tao Islets.

The southwestern point of the entrance to San mun Bay is about 4 miles west-southwestward of the largest of the San mun Islets. There are several rocks close off the entrance point.

Tafu Island lies off the northeastern shore of San mun Bay. The southern extremity of Tafu Island is nearly 6 miles west-north-westward of the southwestern extremity of Lea ming Island. Albert Peak, a remarkable thumb-shaped summit 1,004 feet high, is near the northern extremity of Tafu Island.

Cone Islet, 352 feet high, lies about 1 mile southward of the southern extremity of Tafu Island. Rocks lie in the intervening channel. A reef, with two rocks above water, extends over $\frac{1}{4}$ mile from the southern side of Cone Islet. A rocky islet lies about 600 yards east-southeastward of Cone Islet; there is a rock above water nearly $\frac{3}{4}$ mile northwestward of Cone Islet.

Yang chiao is an islet about $4\frac{1}{4}$ miles westward of Cone Islet. St. George Islet, 165 feet high, lies about $4\frac{1}{2}$ miles northwestward of Cone Islet in the southern entrance to the channel, along the western side of Niu tiu Island, connecting San mun Bay with Shihpu Harbor.

Hsia wan shan is the southernmost of a group of islands on a drying bank. The southern extremity of Hsia wan shan is about 2 miles west-southwestward of St. George Islet; from this extremity the drying bank extends about $2\frac{3}{4}$ miles northwestward. A chain of islets and rocks extends 2 miles from the northwestern end of this bank to the edge of the bank fronting the northern shore of San mun Bay. The passage westward of Hsia wan shan has irregular depths of 5 to 20 fathoms in the fairway; the channel eastward of Hsia wan shan is encumbered with rocks and is unsafe.

Takou shan, about 2 miles southwestward of Hsia wan shan, is the largest of a group rising from the bank extending from the western shore of San mun Bay. Westward of Takou shan is the entrance to a river leading to Kien tiu, a town on the north bank of the river about 2 miles within the entrance.

Quarry Island lies about $6\frac{1}{2}$ miles northwestward of Hsia wan shan. A passage southward of Quarry Island, with a least depth of 3 fathoms, leads to the entrances to the Ninghai River and the Hae yu River at the head of San mun Bay.

Anchorage in San mun Bay.—During the northwest monsoon vessels can anchor westward of Lea ming Island. Vessels must not approach the southwestern extremity of the island closer than 400 yards. The depths shoal quickly after the northern summit of the island bears more than 90° . The bottom is mud.

Vessels can anchor southward of Quarry Island. The depths are 3 to 5 fathoms.

HIESHAN ISLANDS (*H. O. Chart 3180*).—The Hieshan Islands (Ung shan) lie in the southeastern approach to San mun Bay. The group consists of several clifty islets and rocks. The islets are detached from one another, so that little shelter can be obtained.

The three larger islets are inhabited by fishermen.

Saddle Island (Nan-yu-shan) ($28^\circ 52' N.$, $122^\circ 14' E.$, *H. O. Chart 3180*) is the southwesternmost and largest of the Hieshan Islands. It lies about 18 miles southeastward of Cape Conway. Two summits on the island form a saddle-shape; the highest point is 411 feet high.

Shaho Island (Pei-yu-shan) is about $1\frac{1}{4}$ miles northeastward of Saddle Island. The southern end of Shaho Island is clifty. An islet, off the southern side of which is another islet, lies close off the southwestern extremity of Shaho Island. Several rocks lie within a distance of 1,200 yards eastward of Shaho Island. Pai chiao, an islet with a rock awash about 400 yards off its southern side, is about $\frac{3}{4}$ mile westward of the southwestern extremity of Shaho Island.

Shaho Island Light (see Light List) is shown from a white circular tower, 55 feet high, on the summit of a remarkable cliff at the southeastern end of Shaho Island.

Cheng Rock lies about $\frac{3}{4}$ mile northeastward of the northern extremity of Shaho Island.

Mushroom Islet lies about $1\frac{1}{4}$ miles northward of Cheng Rock. The base of the islet has been cut away by the sea; the name of the islet is descriptive of its shape. A rock awash lies about $\frac{1}{4}$ mile north-northwestward of Mushroom Islet. Nearly 2 miles north-eastward of the islet is a rock over which the depth is $1\frac{1}{4}$ fathoms.

COAST AND OFF-LYING ISLANDS BETWEEN SAN MUN BAY AND TAICHOW BAY (*H. O. Chart 3180*).—The coast from the southwestern point of the entrance to San mun Bay trends southward to Pi su Point, the northern point of the entrance to Taichow Bay. This section of coast, about 10 miles long, is very irregular.

Coast.—The northern point of the entrance to Popa Chiang is about $2\frac{1}{4}$ miles south-southwestward of the southwestern point of the entrance to San mun Bay.

Popa Chiang is an inlet extending westward about 8 miles. Yutin Point, the southern point of the entrance to the inlet, is about 5 miles southward of the northern entrance point. A drying bank extends as far as 2 miles from the outer southwestern side of Popa Chiang. Hsiaman Shan and Chumen Shan are islands on this bank. They are nearly connected to each other, and lie within a distance of 2 miles north-northwestward of Yutin Point.

Changhuawan Shan, an island with several islets and rocks around it, lies in the entrance to Popa Chiang with its southern extremity about 3 miles northward of Yutin Point. Pantai men is a channel southward of Changhuawan; Niutou men is the entrance channel

northward of Changhuawan. Pantai men is about $\frac{1}{2}$ mile wide, and has depths of 3 to 4 fathoms in the fairway; the least depth in the approach, however, is only 9 feet. Niutou men is about 400 yards wide, and has depths of $1\frac{1}{2}$ to 4 fathoms in the fairway; the least depth in the approach is 5 feet. The seaward end of Niutou men is encumbered by rocks above water and drying rocks.

Mount Bassett, about 1,400 feet high, lies about 3 miles southwestward of Yutin Point.

Pi su Point, the northern point of the entrance to Taichow Bay, is about $2\frac{3}{4}$ miles southward of Yutin Point.

Off-lying islets.—Nan chai ($28^{\circ}53' N.$, $121^{\circ}46' E.$, *H. O. Chart 3180*), an islet 259 feet high, lies about $4\frac{3}{4}$ miles northeastward of Yutin Point. Pei chai, an islet 236 feet high, lies about $1\frac{1}{4}$ miles northward of Nan chai. A chain of islets and rocks extends about 1 mile southwestward from Pei chai. This group is often referred to as The Chain Islets.

Tienchuang Shan, an islet 52 feet high, lies about $2\frac{1}{4}$ miles westward of Nan chai. A rock 29 feet high and a rock 56 feet high are close off the southwestern side of Tienchuang Shan. Niao Yu, an islet 139 feet high, is nearly 1 mile northwestward of Tienchuang Shan.

Tachi Shan is an islet lying about $2\frac{1}{2}$ miles west-northwestward of Pei chai; numerous islets and rocks lie close off Tachi Shan.

ISLANDS AND DANGERS IN THE APPROACH TO TAICHOW BAY (*H. O. Chart 3180*).—**Fall Island** ($28^{\circ}51' N.$, $121^{\circ}51' E.$, *H. O. Chart 3180*), about $8\frac{1}{2}$ miles eastward of Yutin Point, is 247 feet high. Foul ground, on which are two small islets, extends about $\frac{1}{2}$ mile west-southwestward from the western end of Fall Island.

Pine Cone Islet is nearly 5 miles southwestward of Fall Island. A rock above water lies about 2 miles west-northwestward of Pine Cone Islet; there are several rocks above water and sunken rocks within a distance of 1 mile of the islet. The depths in the vicinity of Pine Cone Islet are probably less than charted.

Kin men, an island lying with its northern extremity about $1\frac{3}{4}$ miles south-southeastward of Fall Island, is about $2\frac{3}{4}$ miles long in a north-northeast and south-southwest direction; it is over 1 mile wide in places. The shores of the island are very irregular; off many of the points are rocks. Nine Pin Island lies close off the southwestern extremity of Kin men; the intervening channel is narrow but deep. This channel terminates a short distance westward of the islands in the bank extending eastward from the mainland coast and having depths are less than 3 fathoms. Nine Pin Island is divided into two parts by a sandy isthmus on which is a rock shaped like a ninepin.

Gau tau Island lies with its northeastern extremity about $3\frac{1}{2}$ miles

southeastward of the northern extremity of Kin men. The northeastern portion of Gau tau Island becomes a separate island at high water. A rock drying 7 feet lies about 600 yards northward of this extremity. A mud spit, with depths of 4 to 5 fathoms, extends about $1\frac{3}{4}$ miles north-northeastward from the northwestern extremity of Gau tau Island. In the southern portion of Gau tau Island are four barren peaks. Some rocks above water lie within 1 mile of the southern extremity of the island; foul ground extends about $\frac{3}{4}$ mile from its western side. Barren Bay is the area between the northwestern side of Gau tau Island and the southeastern side of Kin men. Vessels with local knowledge can secure indifferent shelter between Nine Pin Island and Gau tau Island; the depths are 3 to 6 fathoms.

Tung chu (Bella Vista) **Island** lies with its northeastern extremity about 3 miles southeastward of the northeastern extremity of Gau tau Island. Tung chu Island attains a height of 700 feet. Foul ground, with rocks above water on it, extends about 1 mile southward from its southern extremity. Reef Islet, with a rock close northward of it, lies about $2\frac{1}{2}$ miles south-southwestward of the same extremity. A reef extends about 800 yards eastward from Reef Islet.

Anchorage off Tung chu Island.—Vessels with local knowledge can obtain anchorage off the southern side of Tung chu Island. There is generally a heavy swell. There is shelter from the northeast monsoon.

Chu su Island lies with its northeastern extremity about $5\frac{1}{2}$ miles westward of the southwestern extremity of Tung chu. In the intervening channel, about midway between the islands, is a group consisting of an islet and several rocks. A sharp, cone-shaped summit in the eastern part of Chu su Island is 670 feet high. On a summit in the western part of the island is a **beacon**.

Several islets and rocks lie northwestward of Chu su Island. Mopang Islet lies about $3\frac{1}{2}$ miles westward of the northern extremity of the island. A privately maintained **light** (see Light List) is shown from a black iron framework tower, 32 feet high, on the summit of Mopang Islet; the **fog signal** is a bell. The depths between Chu su Island and the mainland to the westward and northwestward are less than 3 fathoms. A wreck, visible above water, lies sunk on the western side of an islet close off the western extremity of Chu su Island.

Anchorage off Chu su Island.—Vessels with local knowledge can secure good anchorage between the southern extremity of Chu su Island and an islet about $\frac{1}{2}$ mile southwestward of this extremity. A reef extends off the northeastern side of this islet.

• **Fir Cone Islet** is a rocky islet about $2\frac{3}{4}$ miles southeastward of the southern extremity of Chu su Island.

Crate Island, about $3\frac{1}{4}$ miles southeastward of Fir Cone Island, is 259 feet high and cliffy. An islet lies close off the western extremity

of Crate Island; a reef extends about 400 yards from the eastern end of the island.

The Squall Islands are two islands appearing as one except on east-northeasterly or west-southwesterly bearings. The western extremity of the northern island is about $4\frac{1}{2}$ miles southward of the southern extremity of Chu su Island. The northern island is 423 feet high, and has several rocks within a distance of $\frac{1}{2}$ mile of its northwestern extremity. A rock awash lies nearly 400 yards north-northeastward of its northern extremity. A group of rocks lies about $2\frac{3}{4}$ miles west-northwestward of this island.

The southern Squall Island is close southward of the other. Foul ground extends nearly 600 yards from the southeastern side of the southern island.

Three rocks above water and a sunken rock form a group situated nearly midway between the Squall Islands and Chu su Island. The wreck of a vessel sunk in 1926 lies in a position about $1\frac{1}{2}$ miles southeastward of this island.

TAICHOW BAY (*H. O. Chart 3180*).—Taichow Bay is a wide, shallow indentation entered between Pi su Point and an island to the south-southwestward. The Chiao Kiang flows into the head of the bay; the port of Haimen is at the entrance to this river.

The depths in a channel leading to the Chiao Kiang entrance between drying banks extending from the western and northwestern shores of Taichow Bay are 4 to 9 feet. Depths of 3 feet were reported in this channel in 1932.

Entrance—Shores.—The southern point of the entrance to Taichow Bay is Tai chin, an island lying with its northern extremity about $15\frac{1}{2}$ miles south-southwestward of Pi su Point. Tai chin is about $2\frac{1}{2}$ miles long in a north and south direction, and is about $1\frac{1}{2}$ miles wide in its broadest part. A summit near the center of the island is about 800 feet high. The island is about 6 miles from the mainland on the edge of Taichow Flats, a drying bank. This bank recedes toward the mainland in trending generally northwestward toward the head of Taichow Bay. Sanshan Tou is the largest and northernmost of four islets lying within a distance of $1\frac{1}{2}$ miles northward of the northwestern extremity of Tai chin.

North Foreland, an islet 242 feet high, lies about $1\frac{1}{2}$ miles east-northeastward of the northern extremity of Tai chin. A rock, with a depth of 4 feet over it, lies nearly 1 mile northwestward of the northwestern extremity of North Foreland; the position of this rock is doubtful. In the channel, which is about $\frac{1}{2}$ mile wide, between North Foreland and Hsi long to the southward are several rocks above water.

A drying bank also extends off the northwestern shore of Taichow Bay. Mud Island, 247 feet high, lies about 5 miles south-southwest-

ward of Pi su Point. Mud Island and numerous islets and rocks close to it lie on or near the outer edge of this bank.

PORT OF HAIMEN ($28^{\circ}41' N.$, $121^{\circ}26' E.$, *H. O. Chart 3180*).—The port of Haimen is just within the entrance to the Chiao Kiang at the head of Taichow Bay. The harbor, off the town of Haimen on the south bank of the river, is spacious and deep, but access to the harbor is limited by the depths in the channel leading to it through the bay.

Depths.—At high tide a depth of approximately 20 feet can be carried into the harbor.

In 1937 a vessel drawing 16 feet entered and cleared the harbor. This vessel was 250 feet long and had a breadth of 32 feet; its displacement was 928 tons.

Light.—A privately maintained light (see Light List) is shown from a white tower, 15 feet high, on a hill on the southern point of the entrance to Chiao Kiang.

Harbor.—The entrance to the Chiao Kiang is about $\frac{1}{2}$ mile wide. The south bank trends westward for about 6 miles; several creeks flow into the river through this bank. A short distance within the entrance the river widens to a width of about 1 mile.

An area about 1 mile long and a little less than $\frac{1}{2}$ mile wide, northward of the light at the entrance, has depths of 3 to $4\frac{1}{2}$ fathoms. The anchorage area westward of this area is reduced by a partly drying bank in mid-river. The eastern extremity of this bank is about 1,200 yards west-northwestward of the light at the entrance; from this extremity the bank trends about 2 miles west-northwestward. In the channels northward and southward of the bank the depths are 8 to 16 feet.

Anchorage.—Vessels able to enter the harbor can secure good anchorage. The harbor will accommodate about 20 vessels drawing 18 feet or under.

Vessels at anchor in the harbor are sheltered from the northward, westward, and southward.

Tides.—The mean high water interval is 9h. 50m.; the neap rise is 12.1 feet, and the spring rise is 16.1 feet.

HAIMEN ($28^{\circ}41' N.$, $121^{\circ}26' E.$, *H. O. Chart 3180*) is a town with a population of about 20,000. The town of Chienso is on the north bank of the Chiao Kiang opposite Haimen.

Pontoons.—Three wooden pontoons, with a total length of about 276 feet, are available to lighters handling cargo of vessels at anchor. The depths alongside the pontoons are about 10 feet.

Supplies.—Moderate quantities of fuel oil are obtainable from stocks maintained by large oil companies.

Communications.—There is regular communication by steamer with Shanghai. Steamers plying between Wenchow and Ningpo and between Hwangyen and Ningpo call regularly at Haimen.

The town is connected by telegraph with all parts of the country. Haimen is connected with all government and private highways; there is regular bus service to Wenchow and Linghai.

Hospitals.—One general hospital in Haimen has 40 beds; there are 4 smaller general hospitals.

TAICHOW ISLANDS (*H. O. Chart 3180*).—The Taichow Islands lie in the southeastern approach to Taichow Bay. The numerous islands and dangers in the group lie within an area about $9\frac{1}{4}$ miles long in a north and south direction and about $4\frac{1}{4}$ miles wide. Numerous fishing stakes lie from 1 to 6 miles eastward of the Taichow Islands.

Shang Rock ($28^{\circ}32' N.$, $121^{\circ}55' E.$, *H. O. Chart 3180*) is the northernmost islet in the group. It lies about $5\frac{1}{2}$ miles southeastward of Crate Island (p. 393). Shang Rock is 217 feet high. Two rocks are close off its southeastern side.

Shang ta, an inhabited island, lies with its northeastern extremity about 2 miles southwestward of Shang Rock. The intervening channel is deep. The northern end of Shang ta is a peninsula, 366 feet high, connected to the island by a low, narrow isthmus. Chimei chiao, a drying reef, is a part of the foul ground extending about $\frac{1}{4}$ mile northward from the northeastern extremity of the peninsula. Another peninsula extends from the northwestern side of the island; an islet and rocks, above and below water, lie within $\frac{1}{4}$ mile of the western extremity of this peninsula. Chuyao yu is the outermost islet of a number of islets and rocks extending about 1 mile southwestward from the southwestern extremity of Shang ta. A rock, with a depth of 2 fathoms over it, lies about 600 yards southwestward of Chuyao yu. A bank, with depths of less than 3 fathoms, extends as far as $1\frac{1}{4}$ miles from the western shore of Shang ta between Chuyao yu and the peninsula off the northwestern extremity of the island.

Anchorage off Shang ta.—Anchorage, with good holding ground, can be taken westward of Shang ta. Note that the depths between the island and the mainland to the westward are less than 5 fathoms, or approximately 1 fathom less than charted.

Tides.—The mean high water interval in a position ($28^{\circ}28' N.$, $121^{\circ}52' E.$, *H. O. Chart 3180*) in about the center of the Taichow Islands is 8h. 50m.; the mean range is 11.8 feet, and the spring range is 14.4 feet.

Hea ta, an inhabited island about 738 feet high in its central part, lies southward of Shang ta. The intervening channel, about 1 mile wide, trends northeastward and southwestward past the islands. There are numerous fishing stakes in both entrances. Vessels can enter this channel from the westward and from the eastward. The depths in the western part of the channel, northeastward of Chu yu, are not more than $4\frac{1}{4}$ fathoms.

Pingfeng Shan, an islet 307 feet high, lies close off the northeastern extremity of Hea ta. There are several islets and rocks off its northern extremities. The northern and southeastern sides of

Pingfeng Shan are clifty. A privately maintained **light** (see Light List) is occasionally shown on the eastern extremity of Pingfeng Shan.

Chu yu, an islet 180 feet high, lies westward of the southwestern extremity of Hea ta. The intervening channel, about $\frac{1}{2}$ mile wide, is encumbered by rocks extending 400 yards eastward from the eastern side of Chu yu. A small islet is joined to the southwestern end of Chu yu by a reef. Foul ground, extending nearly $\frac{1}{2}$ mile southward from the southern side of Chu yu, terminates in an islet, Ken yu. A spit, on the outer end of which is a rock drying 3 feet, extends about $\frac{1}{4}$ mile north-northeastward from Chu yu. Yuwei chiao, a rock with a depth of 3 fathoms over it, lies about 700 yards northwestward of Chu yu.

Kisan, an island 339 feet high, lies about $1\frac{3}{4}$ miles southeastward of the southwestern extremity of Hea ta. Kisan is clifty except on its northern side. There are islets close off its southeastern and northeastern extremities. Nuhsin chiao, a rock drying 10 feet, lies about 1 mile west-southwestward of Kisan. Lientzu, a rock 14 feet high, lies nearly 2 miles southwestward of Kisan.

Hea chu is the southernmost of the Taichow Islands. It lies about $1\frac{1}{4}$ miles southeastward of Kisan. Hea chu attains a height of 468 feet near its southern extremity. The island is clifty except on its northern side. On its southeastern side is a conspicuous yellow streak; close off its southern extremity is Finger Rock, a remarkable islet 169 feet high. Other islets are close off the southeastern side and the northeastern extremity of Hea chu. The channel between Hea chu and Kisan, encumbered by several rocks and islets, should not be attempted.



Finger Rock.

Hea chu (Taichow Islands) bearing northwestward, distant 2 miles.

Shoal.—A $3\frac{3}{4}$ -fathom shoal was reported (1939) in a position about $4\frac{1}{2}$ miles southward of Hea chu; the position is approximate.

COAST AND OFF-LYING ISLANDS BETWEEN TAICHOW BAY AND YUHWAN TAO (*H. O. Chart 3180*).—The irregular coast between Taichow Bay and the large island, Yuhwan Tao, forms two large bays, Ye van and Huan men, and numerous small bays.

Yuhwan Tao (Tau Island) is separated from the mainland only by a very narrow passage.

Coast.—The coast forming the western side of Taichow Bay trends south-southeastward to a peninsula near the extremity of which is the walled town of Song men ($28^{\circ}21' N.$, $121^{\circ}36' E.$, *H. O. Chart 3180*). The southern side of this peninsula forms the northern shore of Ye van Bay, an extensive but shoal indentation. The northeastern point of the entrance to this bay is Song men Point, the southwestern extremity of Tau pung Island. A narrow channel, Penetration Pass, separates Tau pung Island from the eastern side of the peninsula on which is the town of Song men. Penetration Pass is available to native craft only. The southwestern point of the entrance to Ye van Bay is Hebe Head, about $13\frac{1}{2}$ miles southwestward of Song men Point.

Off-lying islands.—A considerable number of islets and islands lie between Tau pung Island and Tai chin (p. 394), the southern point of the entrance to Taichow Bay. These islands and islets are on, or very nearly on, the outer edge of a drying bank extending as far as 6 miles from the mainland to the westward. The southern extremity of Tai chin is nearly 10 miles northward of the northern extremity of Tau pung Island.

Outside this chain of islands are the islands Chiku San, Low Chiku San, Crookback Island, and several islets and rocks. Chiku San, an island about $3\frac{1}{2}$ miles east-northeastward of the northern extremity of Tau pung Island, is a conical island 760 feet high. A broad yellow stripe is on the southeastern side of the hill; the island is an excellent landmark.



Chiku San bearing northwestward, distant 2 miles.

Low Chiku San is about 1 mile north-northwestward of Chiku San. Half-tide Rock lies about 600 yards northeastward of Low Chiku San. A rock awash lies nearly 3 miles north-northwestward of the island; about 4 miles farther north-northwestward is a rock drying about 7 feet.

Crookback Island is westward of Chiku San; the intervening channel is narrowed to a width of about 1 mile by rocks extending from the eastern side of Crookback Island. A vessel reported (1907) striking

an obstruction, probably a rock, in a position about $\frac{3}{4}$ mile northwestward of Chiku San. The obstruction is in about the middle of the northern entrance to the channel.

Soudan Island ($28^{\circ}16' N.$, $121^{\circ}44' E.$, *H. O. Chart 3180*) is nearly 7 miles southward of Chiku San. A reef lies close off the southern side of Soudan Island. The island is about 120 feet high. A privately maintained **light** (see Light List) is occasionally shown on the island.

Shetung Island lies about midway between Soudan Island and Tau pung Island. A reef lies about 600 yards off the southern side of Shetung Island; there are several rocks off the southeastern extremity of the island. A wreck, dangerous to navigation, lies sunk about 2 miles southwestward of Shetung Island.

Two islets lie between Shetung Island and Tau pung Island. A reef, with three rocks above water on it, extends about 1 mile northeastward from the eastern islet. The channel between Shetung Island and this eastern islet has a least depth of $3\frac{1}{4}$ fathoms; the channel between the two islets is not navigable.

The Stragglers are a compact group of rocks lying about $1\frac{1}{4}$ miles southwestward of Soudan Island.

San shi Island lies about $2\frac{1}{2}$ miles southeastward of Song men Point on Tau pung Island. Two reefs are close off the western side of San shi Island. An islet, with a reef off its northeastern end, lies about $1\frac{1}{4}$ miles southeastward of San shi Island; an islet lies in the intervening channel. An islet, with a reef off its southern side, lies about 1 mile northward of San shi Island. The channel, about 1 mile wide, between these islets and the numerous rocks lying off the southern end of Tau pung Island, has a least depth of 4 fathoms; this channel is navigable by those with local knowledge.

Flat Rock, with a submerged rock about 300 yards northeastward of it, lies about $2\frac{1}{4}$ miles southwestward of Song men Point. Another flat rock, with a rock awash close off its southeastern side, lies nearly 3 miles south-southeastward of the point. Several rocks and reefs lie within a distance of 1 mile of Song men Point.

Coast.—Hebe Head ($28^{\circ}09' N.$, $121^{\circ}21' E.$, *H. O. Chart 3180*) is the northeastern point of the entrance to Huan men Bay. The northeastern side of this shoal bay is formed by the mainland coast northwestward of Hebe Head; the western and southwestern side of the bay is formed by the irregular eastern shore of Yuhwan Tao (Tau Island). Drying flats extend from the shores of Huan men Bay; some reefs and an islet lie on the flat off the northeastern side. A narrow passage leads off from the head of Huan men Bay to connect with the inlet, Lo ching ou (p. 402). This passage is available only to small craft. The narrowest part, around a sharp bend about $5\frac{3}{4}$

miles northwestward of Hebe Head, is dangerous; here a privately maintained **light** (see Light List) is shown.

The southwestern point of the entrance to Huan men Bay is about $4\frac{1}{2}$ miles southwestward of Hebe Head; this point is about 2 miles northward of Kanmen Tow, the southeastern extremity of Yuhwan Tao (Tau Island).

Off-lying islands.—Numerous islands, within a distance of 9 miles of Hebe Head, lie both in the southern approach to Ye van Bay and in the eastern approach to Huan men Bay.

Chin ki (Hwocha Shan) is an island, 198 feet high, lying with its northeastern extremity about $1\frac{3}{4}$ miles southward of Hebe Head. Close northward of the western extremity of Chin ki is Yuan yu, an islet 120 feet high. Yuan yu is on a drying bank extending from the northwestern shore of Chin ki.

Tauan is an island about $\frac{3}{4}$ mile northeastward of Chin ki; the intervening channel is encumbered by a reef extending northeastward from Chin ki, and by a submerged rock in midchannel. There are several rocks and shoals between Tauan and Hebe Head.

Taluk, an island 770 feet high, is the highest of the islands off Hebe Head. It lies about $2\frac{1}{4}$ miles south-southeastward of Tauan; in the intervening channel is an islet and several rocks. Vessels with local knowledge can anchor in depths of 3 to 4 fathoms between Chin ki and Taluk.

The northernmost of the three Seoluk Islets lies about $1\frac{1}{4}$ miles southward of Taluk. The southernmost islet is about $1\frac{1}{4}$ miles southward of the northernmost islet. Vessels proceeding through the channel between the northernmost islet and Taluk should hold the Taluk side of the channel.

Pe shan is an island lying with its southwestern extremity about $4\frac{1}{2}$ miles eastward of Taluk. Two islets lie close together in a position about $\frac{1}{2}$ mile southward of the southeastern extremity of Pe shan. Fishing stakes, connected by strong ropes, extend from a position about 9 miles southward of Pe shan to a position about 9 miles eastward of the island.

Flare Islet, 1 mile northwestward of Pe shan, is low and flat. Sugarloaf Islet, about $1\frac{1}{4}$ miles northward of Flare Islet, has a rock close off its northern extremity.

YUHWAN TAO (TAU ISLAND) is about 10 miles long in a north and south direction, and about $8\frac{1}{2}$ miles wide across its broadest part. The shores of the island are very irregular. Kanmen Tow ($28^{\circ}04' N.$, $121^{\circ}17' E.$, *H. O. Chart 2546*) is the southeastern extremity of Yuhwan Tao. Kanlu Tsui, about $7\frac{1}{2}$ miles west-southwestward of Kanmen Tow, is the southwestern extremity of the island.

The southern shore of the island between Kanlu Tsui and a point

about 4 miles east-northeastward is cliffy and fairly steep-to. The latter point is the western point of the entrance to a bay, about 1 mile wide across its entrance, nearly filled by a drying flat.

Hwangmen Shan, an island 435 feet high, lies with its northwestern extremity about $\frac{1}{2}$ mile southeastward of the eastern entrance point of this bay.

KANMEN WAN (KEMONG HARBOR) ($28^{\circ}04' N.$, $121^{\circ}16' E.$, *H. O. Chart 2545*) is an area between Hwangmen Shan and Nanpai Shan, an island northeastward of Hwangmen Shan; the harbor includes a bay indenting the southern shore of Yuhwan Tao to a distance of about $1\frac{1}{2}$ miles. The head of this bay is shoal.

Nanpai Shan, an island 348 feet high, lies with its eastern extremity about $\frac{1}{2}$ mile south-southwestward of Kanmen Tow. Foul ground extends about 300 yards eastward from the eastern end of the island, and also as far as 400 yards from the western part of the southern shore. A reef drying 4 feet lies close off the southwestern side of the island; a rock awash is close northward of the reef.

Channels leading to Kanmen Wan.—The channel, about $1\frac{1}{4}$ miles wide, leading northwestward between Hwangmen Shan and Nanpai Shan is the principal entrance channel. Meier Rock, drying 3 feet, lies about 800 yards off the southwestern end of Nanpai Shan, nearly in midchannel. The channel between Meier Rock and Hwangmen Shan is about $\frac{3}{4}$ mile wide, and has depths of $5\frac{1}{4}$ to 7 fathoms.

Waihwang Men is a channel along the northwestern side of Hwangmen Shan. On the opposite side of the channel, abreast Hwangmen Shan, is an islet, 207 feet high, nearly connected to the shore of Yuhwan Tao by a reef. There is a least depth of 8 fathoms in the fairway through Waihwang Men; the channel is narrowed to a width of about 100 yards by an islet lying close off the northwestern extremity of Hwangmen Shan.

Tung Men is the channel between the shore of Yuhwan Tao and Nanpai Shan. Kanmen Tow is the northern point of the entrance to Tung Men. Kuan ti yu is a small islet on the northern side of this channel in a position about $\frac{1}{2}$ mile westward of Kanmen Tow. An islet close off the northwestern extremity of Nanpai Shan is on the southern side of this channel. Tung Men is about 250 yards wide, and has a least depth of 5 fathoms in the fairway.

Light.—A privately maintained light (see Light List) is shown from a white masonry tower, 15 feet high, on Kanmen Tow.

Anchorage.—Vessels drawing up to 25 feet can secure good anchorage in Kanmen Wan. There is shelter from all except southeasterly winds. Note that there is generally a large number of junks in the harbor.

Tides.—The high water interval at full and change at Kanmen is 9h. 35m.; springs rise 19 feet, neaps 14 feet.

Kanmen ($28^{\circ}05' N.$, $121^{\circ}17' E.$, *H. O. Chart 2545*).—The town, about $1\frac{1}{4}$ miles northwestward of Kanmen Tow, is at the head of a shallow bight within the bay forming a part of the harbor. Fresh water is obtainable at short notice. Steamers plying between Shanghai and Wenchow call regularly. There is long distance telephone service to nearby cities.

LOTSING WAN (*H. O. Charts 3180 and 2546*).—Lotsing Wan is an extensive indentation between the western shore of Yuhwan Tao and the mainland to the westward. Lo ching ou is an estuary extending northward from the head of Lotsing Wan.

Lotsing Wan is free of dangers in its southern part. In the northern part and in Lo ching ou are extensive shoal areas and islands.

Eastern side of Lotsing Wan—Off-lying islets and dangers.—A rock awash lies nearly 200 yards off the western side of Kanlu Tsui, the southwestern extremity of Yuhwan Tao. Hengchih Shan, an island 398 feet high, lies about $\frac{3}{4}$ mile southward of the extremity. A shoal, with depths less than 3 fathoms, extends about 600 yards from the northwestern side of Hengchih Shan. Kanlu Kiao, a detached rock with a depth of $1\frac{1}{4}$ fathoms over it, lies about $\frac{3}{4}$ mile northward of the southwestern extremity of Hengchih Shan. A wreck, dangerous to navigation, lies in the entrance to Lotsing Bay, in a position about $1\frac{1}{2}$ miles west-northwestward of the southwestern extremity of Hengchih Shan. The channel between Kanlu Kiao and Kanlu Tsui is clear and deep.

From Kanlu Tsui the western shore of Yuhwan Shan trends north-northwestward about 6 miles to a point off which is an islet, Lien Yu. Chitan Shan, Siaomai Yu, and Tamai Yu, are islets between Kanlu Tsui and Lien Yu. The shore of Yuhwan Shan trends north-eastward from abreast Lien Yu to the northern extremity of the island.

Western side of Lotsing Wan.—The western point of the entrance to Lotsing Wan is about 4 miles north-northeastward of Chi Tow, the northern point of the entrance to the Wu Kiang (p. 410). The western point of the entrance to Lotsing Wan is hilly; about $\frac{3}{4}$ mile within the point is a summit 497 feet high. The western side of the bay between this point and a point about 9 miles north-northeastward is bordered by a bank that dries out as far as $2\frac{3}{4}$ miles in places.

Anchorage in Lotsing Wan.—Good anchorage can be obtained in the southern part of Lotsing Wan. The depths within a distance of $2\frac{3}{4}$ miles of the western shore of Yuhwan Shan are 5 to 8 fathoms; the western shore of Yuhwan Shan is steep-to, fairly close outside lines joining the salient points of this shore. Lotsing Wan is a useful typhoon refuge.

Lo ching ou.—This estuary extends about 12 miles in a northerly direction from the head of Lotsing Wan northward of Lien Yu. The

estuary connects with the narrow passage leading northwestward from the bay, Huan Men, westward of Hebe Head. The estuary is encumbered by many islands, and by shoals extending from both shores.

WENCHOW BAY (*H. O. Chart 2546*).—Wenchow Bay, sometimes called Wenchow Yang, is an area enclosed by islands southward of Yuhwan Tao and islands in the outer approaches to the Wu Kiang. Between Pehkiang and Hutow Yu, islets at the northern and southern ends, respectively, of this area, Wenchow Bay is about 10 miles wide. The eastern shores of islands southwestward and northwestward, respectively, of Pehkiang and Hutow Yu, form the western limits of Wenchow Bay.

Islands enclosing Wenchow Bay.—Pehkiang ($28^{\circ}01' N.$, $121^{\circ}16' E.$, *H. O. Chart 2546*), an islet 187 feet high, lies about 2 miles south-southeastward of Hwangmen Shan. A rock, with a depth of 4 fathoms over it, lies about $\frac{1}{2}$ mile westward of the southern extremity of Pehkiang. Nankiang, an islet about 198 feet high, lies close south-southwestward of Pehkiang.

Pingtow (Tunghwan) Shan is an island about $3\frac{1}{2}$ miles long in an east and west direction, and about $1\frac{1}{2}$ miles wide. It lies with its eastern extremity about 3 miles south-southwestward of Hwangmen Shan. The western and higher part of the island attains a height of 792 feet. Changyu Kiao, a rock 15 feet high, lies close off the southwestern extremity of Pingtow Shan. Taokantang, a long, narrow islet, lies southeastward of the southwestern extremity; the intervening channel, about 700 yards wide, is clear and deep. Pailung Yu, with several other islets and rocks nearby, lies on the outer edge of a shoal extending about 600 yards southward and eastward from the eastern extremity of Pingtow Shan. The channel, about 2 miles wide between Pingtow Shan and Chuhu Tao to the southeastward, is clear; the depths are $6\frac{1}{4}$ to 11 fathoms except over a bank, with depths less than 5 fathoms, extending nearly $1\frac{1}{4}$ miles southward from the eastern part of the southern shore of Pingtow Shan. Tsikow Yang, the channel between Pingtow Shan and Hengchih Shan to the northwestward, is about 2 miles wide; the depths are less than 3 fathoms over the greater part.

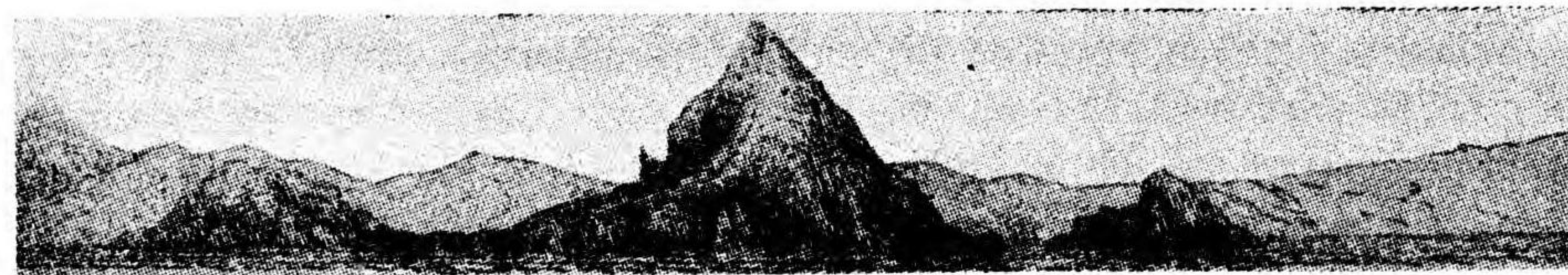
Chuhu Tao, Maotsao Shan, and Tung Yu are the three principal islets of a compact group of islets and rocks in the northwestern part of Wenchow Bay. Chuhu Tao, the northernmost islet, lies about $4\frac{1}{4}$ miles southwestward of Pehkiang, and consists of two portions joined by reefs; the highest point is 83 feet high. Maotsao Shan, 133 feet high, lies about $\frac{1}{2}$ mile southwestward of Chuhu Tao. Tung Yu, the southernmost islet, lies about $\frac{1}{2}$ mile southeastward of Maotsao Shan.

Pikia Kiao, an islet 144 feet high near its northeastern extremity, lies about $3\frac{1}{4}$ miles west-southwestward of Tung Yu; the islet is jagged and dark brown in color. At a distance the rock appears split in two parts.

Siamia Kiao, a brown, rocky islet 60 feet high, lies about 800 yards southwestward of Pikia Kiao. The channel between the islets is clear and deep.



Hutow Yu bearing 247° , 3 miles distant.



Iyu Shan.

Hutow Yu bearing 287° , 1 mile distant.
Two views of Hutow Yu. (Originals dated 1844)

Hutow Yu (Coin Island) ($27^\circ 50' N.$, $121^\circ 15' E.$, *H. O. Chart 2546*) attains a height of 335 feet in a sharp, conspicuous peak in the southeastern part of the island. An islet lies close northward of the western extremity of Hutow Yu and is connected to the extremity by a reef. Another islet lies about 300 yards westward of this extremity. Yuan Yu and Chihtow Yu are islets at the southern and northern ends, respectively, of a reef, about $\frac{1}{2}$ mile long, lying about 1,100 yards west-northwestward of Hutow Yu.

ISLANDS IN THE SOUTHEASTERN APPROACH TO THE WU KIANG (*H. O. Chart 2546*).—The southeasternmost group of islands in the approach to the Wu Kiang consists of four large islands and a number of islets and rocks. This group is sometimes called the Tse Islands.

Heiniu Wan, a convenient typhoon refuge, is partially sheltered by these islands.

The numerous islets and dangers between the Tse Islands and the group Pehkishan Liehtao, to the south-southeastward, are described on page 415.

Tse Islands.—Nantse Shan ($27^\circ 46' N.$, $121^\circ 08' E.$, *H. O. Chart 2546*), the southwesternmost and largest of the Tse Islands, attains a height of 599 feet in about its center.

Pehtse Shan, 510 feet high, is close northward of Nantse Shan; this island is connected at low water with the northeasternmost island, Sitse Shan.

Tungtse Shan, 573 feet high, is the southeasternmost of the Tse Islands. Foul ground, from which rise several islets and rocks, extends nearly $\frac{1}{2}$ mile southeastward from the southeastern side of Tungtse Shan.

Tungnan Men is the narrow channel separating Nantse Shan and Tungtse Shan to the southward from Pehtse Shan and Sitse Shan to the northward. The fairway through Tungnan Men has depths of $5\frac{1}{2}$ to 11 fathoms, but the channel leads westward, past the islands, over a bank with depths of $3\frac{1}{2}$ fathoms.

Hein u Wan (Bullock Harbor) is an area enclosed by several islands. The Tse Islands are on the eastern side of the entrance to the harbor from southward. On the outer western side of this entrance is Tachu Shan, an island, 789 feet high, lying about 2 miles west-northwestward of Pehtse Shan. The channel between the latter island and Tachu Shan has maximum depths of $3\frac{1}{2}$ fathoms. Tachu Shan is clifty on its southern and southeastern sides; a 17-foot patch lies about $\frac{1}{2}$ mile southeastward of its southeastern extremity. A spit, with depths less than 3 fathoms, extends about 1 mile westward from the western side of Pehtse Shan.

Panmien Shan is on the eastern side of the inner portion of Heiniu Wan. Panmien Shan is an island attaining a height of 480 feet in its southwestern portion. The island lies with its southwestern extremity about $\frac{3}{4}$ mile northward of the northern extremity of Pehtse Shan. A drying flat extends from the northwestern side of Panmien Shan; the channel between the outer edge of this flat and the southern shore of Tungtow Shan, to the northward, is narrow and shoal.

Tungpeh Men is the channel between Panmien Shan to the northward, and Pehtse Shan and Sitse Shan to the southward. The fairway is 800 yards wide and has depths of more than 20 fathoms. Tungpeh Men leads westward to the deepest part of Heiniu Wan.

On the western side of the inner portion of Heiniu Wan are the islets Chungchu Shan and Siochu Shan. These are 194 feet high and 216 feet high, respectively. Chungchu Shan lies about $1\frac{1}{4}$ miles southward of the western extremity of Tungtow Shan, and Siochu Shan lies about $\frac{3}{4}$ mile southward of the same extremity. Sinan Men is the channel between Chungchu Shan and Tachu Shan; Sipeh Men is the channel between Siochu Shan and the western part of the southern shore of Tungtow Shan. Both channels are clear and deep, but after passing the islands each leads over a bank with depths less than 3 fathoms.

Niushih Kiao, a stony islet 27 feet high, lies on the northern side of Sipeh Men, in a position close westward of the western extremity of Tungtow Shan.

Anchorage.—Vessels can obtain excellent anchorage in Heiniu Wan in depths of 3 to 7 fathoms. There is shelter from all except

southerly and southwesterly winds; these winds send in a heavy swell. The harbor is a typhoon refuge. Note that the harbor is usually greatly obstructed by fishing stakes and nets.

Vessels can anchor northwestward of Siao-chu Shan, and also westward of Niushih Kiao. Both of these anchorages afford shelter.

Islets and dangers eastward of Tungtow Shan.—Tachih Yu ($27^{\circ}50' N.$, $121^{\circ}13' E.$, *H. O. Chart 2546*), about $1\frac{1}{2}$ miles eastward of the southeastern extremity of Tungtow Shan, is 238 feet high near its western extremity. Foul ground, on which are the islets Siao-chih Yu and Waichih Yu, extends about $\frac{1}{2}$ mile southward from the southwestern extremity of Tachih Yu. Chih Kiao, an islet 63 feet high, is on a partly drying reef lying about 600 yards northwestward of the western extremity of Tachih Yu.

Ao Kiao is the northernmost of several detached reefs and rocks lying within a distance of 1 mile of the northern part of the eastern shore of Tungtow Shan. King Kiao, Sha Kiao, Man Kiao, and Wu Kiao, are other dangers in this area. King Kiao is awash.

ISLANDS IN THE SOUTHEASTERN APPROACH TO THE WU KIANG (continued)—**TUNGTOW STRAIT** (*H. O. Chart 2546*).—A considerable number of the islands in the southeastern approach to the Wu Kiang lie on either side of a channel, Tungtow Strait, that trends northeastward to connect with Wenchow Bay.

The depths in the southwestern entrance to this strait are $2\frac{1}{2}$ to 3 fathoms. Northward of the western extremity of Tungtow Shan, however, is a bar over which the least depth is 11 feet. Northeastward of this bar the depths increase to 3 fathoms and more. The northeastern entrance to Tungtow Strait is deep. The strait is available only to light-draft vessels possessing local knowledge.

Islands on the southeastern side of Tungtow Strait.—The southwesternmost island is Tachu Shan ($27^{\circ}47' N.$, $121^{\circ}05' E.$, *H. O. Chart 2546*). A bank with depths less than 3 fathoms extends northwestward across Tungtow Strait from the northwestern side of Tachu Shan (for principal description see p. 405). Sinan Men and Sipeh Men connect from the southeastward with the strait.

Tungtow Shan is a large island attaining in Yentun Shan, a summit near the northwestern extremity, a height of 750 feet. The island is over 6 miles long in an east-northeast and west-southwest direction. The shores of the island are very irregular; the bays are in most cases filled by drying flats. A drying bank extends over $\frac{1}{2}$ mile from the northwestern shore of the island.

Tasanpang Shan lies off the eastern end of the northern shore of Tungtow Shan. The narrow intervening channel is available to boats. A rocky islet, with a rock awash close off its eastern side, lies in the middle of this channel. Sankiao Yu, an islet 73 feet high, lies about

800 yards southwestward of the southwestern extremity of Tasanpang Shan on the edge of a drying flat extending from Tungtow Shan. Another islet, with reef extending from its eastern and western extremities, lies about 400 yards northward of Sankiao Yu.

Islands on the northwestern side of Tungtow Strait.—Iyu (Miow) Shan (see view on p. 404) is a large island lying with its southwestern extremity, Mao Tsui, about 4 miles northwestward of the northwestern extremity of Tachu Shan. Iyu Shan is nearly 4 miles long in a northeast and southwest direction, and over 2 miles wide across its broadest part. Mao Tsui is the southwestern extremity of a peninsula connected to the main part of Iyu Shan by a low isthmus. A hill on Mao Tsui is 135 feet high; the highest peak on the main part of the island is about 2 miles northeastward of this hill and is 1,083 feet high.

Siao-i Yu, an islet 110 feet high, is the largest of three islets and several rocks lying within a distance of $1\frac{1}{4}$ miles from Mao Tsui. I Kiao, an islet 44 feet high, is close eastward of Siao-i Yu; an islet 21 feet high is close southwestward of Siao-i Yu. Lungsu, a reef drying 7 feet, lies nearly 4 miles west-southwestward of Mao Tsui. Lungmu Kiao (Pang peto Reef) is about 1,100 yards south-southwestward of Lungmu, and dries 18 feet. A rock drying 7 feet and a rock drying 15 feet are close westward of Lungmu Kiao. These dangers lie on the bank extending from the mainland southward of the entrance to the Wu Kiang.

Chuanyuanow Shan is an island lying with its southwestern extremity about 1,400 yards eastward of the eastern extremity of Iyu Shan. A drying flat nearly fills the intervening channel; two islets rise from this flat. Sheng Men, a channel available to boats, lies between the southwestern extremity of Chuanyuanow Shan and the eastern edge of this flat. A hill near the southwestern extremity of Chuanyuanow Shan is 308 feet high; from this hill the land rises to the summit of the island, 765 feet high, where there are two mounds close together. These mounds are conspicuous on easterly and westerly bearings. Wentze Tow is the outer end of a long, narrow tongue of land forming the northeastern portion of Chuanyuanow Shan.

Hwakien Shan, an islet 325 feet high, lies close off the southeastern extremity of Chuanyuanow Shan. The islet is on the outer edge of a drying flat extending from the southern shore of the island. The eastern side of Hwakien Shan is a steep cliff that rises rather abruptly to the summit of the island, on which is a conspicuous mound. A rock above water lies close off the southeastern extremity of Hwakien Shan; a reef, with a depth of 2 fathoms over it, extends about 400 yards southward from the rock. A reef extending about 200 yards southwestward from the southwestern extremity of Hwakien Shan terminates in a rock above water. A rocky ledge, drying 11 feet, lies

about 600 yards west-southwestward of this rock. A privately maintained **light** (see Light List) is shown from a white tower, 17 feet high, on the southeastern side of Hwakien Shan.

Sanpang Men is the channel between Hwakien Shan to the northwestward and Tasapang Shan to the southeastward; Sanpang Men is the northeastern entrance to Tungtow Strait. The fairway through the channel is about 400 yards wide, and is deep.

Anchorage in Tungtow Strait.—During the southwest monsoon vessels can obtain good anchorage off the northern side of Tapanpang Shan.

CHANNELS LEADING TO THE WU KIANG ENTRANCE

(*H. O. Chart 2546*).—Three channels trend past the islands off the entrance to the Wu Kiang. Ta Men, the northernmost channel, lies between Siaomen Shan and Hwangtaow Tao; North Passage lies between Hwangtao Tao and Chung San; South Passage lies between Chung Shan and Chuanyuanow Shan.

North Passage is available to oceangoing vessels; Ta Men and South Passage are used by junks.

North Passage (Peh Shuitao).—Chung Shan ($27^{\circ}55' N.$, $121^{\circ}07' E.$, *H. O. Chart 2546*), on the southern side of North Passage, has a remarkable appearance. The land rises gradually from the various points on the northern, western, and eastern shores in long spurs to heights approximately half the maximum height of the island. The spurs then rise abruptly to a summit 752 feet high. The sides of the summit are rocky. The rise of the land from the southern shore of the island is more gradual; two shoulders, not as high as the summit, mark this side of the island. Chung Shan is a little over 1 mile long in a northeast and southwest direction, and about $\frac{3}{4}$ mile wide.

Siaochung Shan, an islet 154 feet high, lies about 800 yards southeastward of the northeastern extremity of Chung Shan; the intervening channel is shoal. A rocky ledge extends about 200 yards eastward from the eastern extremity of Siaochung Shan.

Sishan Tsui is a small islet off the western extremity of Chung Shan; Chungshan Spit, which dries in places, extends about $3\frac{1}{2}$ miles westward from the western side of Chung Shan.

Hwangtaow Tao (Tamen Shan), on the northern side of North Passage, lies with its southern extremity about $1\frac{1}{4}$ miles northwestward of the northeastern extremity of Chung Shan. Hwangtaow Tao is mountainous; a steep ridge trends eastward and westward through its northwestern part. A peak, Tamen Shan, on this ridge is about $1\frac{1}{2}$ miles northeastward of Hwangta Tsui, the southwestern extremity of the island, and is 1,224 feet high. Hwangtaow Shan, a peak on this ridge in a position about 1 mile southwestward of the northeastern extremity of the island, is 1,290 feet high. A precipitous

peak, with a boulder on its summit, lies about $\frac{1}{2}$ mile southward of Hwangtaow Shan, and is 1,149 feet high.

The southern shore of Hwangtaow Tao between Tung Tow, the eastern extremity of the island, and the southern extremity, about 3 miles west-southwestward, is bold and cliffy. About midway between these points are some black jagged rocks under the cliffs; some rocks drying 10 feet lie close eastward of the black rocks. About $\frac{1}{2}$ mile westward of Tung Tow is a small bay where junks and boats can take shelter from the northeast monsoon; a heavy swell sets into the bay. A small bay close eastward of the southern extremity of Hwangtaow Tao has some rocks close off its eastern entrance point; boats can take shelter behind these rocks. A drying rock is close off the southern extremity.

Between the southern extremity of Hwangtaow Tao and Hwangta Tsui, the southwestern extremity, is a bay entirely filled by a drying flat. Tsingling Yu, an islet about $\frac{3}{4}$ mile westward of the southern extremity of Hwangtaow Tao, has on it a sharp peak 156 feet high; smaller rocks lie off the southern side of Tsingling Yu. A rock awash lies about 300 yards southwestward of Hwangta Tsui.

A drying flat extends about $\frac{1}{4}$ mile westward from the western shore of Hwangtaow Tao; Chwangtai Yu and a smaller islet lie on this flat.

The fairway through the western portion of North Passage trends between the southern shore of Hwangtaow Tao and the northern side of Taotze Sha, a long, narrow shoal, drying in places; Taotze Sha is approximately parallel to the western half of the southern shore of Hwangtaow Tao; the fairway is about $\frac{1}{2}$ mile wide. Note that fishing stakes are thickly strewn between Hwangtaow Tao and Chi Tow, the northern point of the entrance to the Wu Kiang.

The channel to the Wu Kiang entrance from the western end of North Passage leads southward of Sankiao Sha. The latter consists of several banks, some of which dry; these banks are continually shifting. A conical stone **beacon**, with a flat top, stands on Sankiao Sha in a position about $1\frac{1}{4}$ miles eastward of Chi Tow, the northern point of the entrance to the Wu Kiang.

Anchorage off Tsingling Yu.—Vessels can anchor eastward of Tsingling Yu; the depths are 6 fathoms, and the holding ground of stiff mud is good. This anchorage is well sheltered.

Tidal currents.—The ingoing tidal current near Tsingling Yu has a maximum rate of 2 knots, and the outgoing current a maximum rate of $2\frac{1}{2}$ knots. After passing Tsingling Yu the water changes from clear and salty to muddy and brackish.

Off Hwangta Tsui the current changes from ingoing to outgoing gradually through north, and from outgoing to ingoing through south, slack water lasts only a few minutes.

South Passage (Nan Shuitao).—Chikwan Shan lies in the north,

eastern entrance to South Passage in a position about 800 yards southeastward of the southeastern extremity of Chung Shan. Chikwan Shan is a rugged islet, 52 feet high. Rocks above water and sunken rocks extend about 200 yards northward and southwestward from the islet.

Wushih Kiao, a rock drying 4 feet, lies on the southern side of South Passage in a position about 1½ miles southwestward of Chikwan Shan; a rock drying 3 feet is close southwestward of Wushih Kiao.

Anchorage in South Passage.—Vessels can anchor southwestward of Chung Shan in depths of 4 to 7 fathoms. There is fairly good shelter, but there are numerous fishing stakes in the vicinity.

Ta Men.—Siaomen Shan, an island about 2¾ miles long, forms the northwestern side of Ta Men. This channel has a least width, between the northwestern extremity of Hwangtaow Tao and the southeastern side of Siaomen Shan, of about 600 yards. The depths in the northeastern entrance are over 3 fathoms, but at the southwestern end of the channel there are depths of only a few feet.

Other channels leading to the Wu Kiang entrance.—Siao Men, a channel about ¼ mile wide, leads between the northwestern side of Siaomen Shan and the southeastern sides of two islets, Tawusing and Hsiaowusing. The northeastern end of Siao Men has depths of 3¾ fathoms and over, but the southwestern end of the channel is very shoal.

Shatow Channel lies between a drying flat extending from the mainland to the northwestward and the northwestern side of Sankiao Sha. The depths in Shatow Channel are everywhere less than 3 fathoms.

WU KIANG (*H. O. Chart 2546*).—The Wu (Ou) Kiang, also called the Wenchow River, flows generally east-southeastward along the last part of its course to enter the sea southward of Chi Tow, a point about 4¾ miles northwestward of Hwangta Tsui.

The walled city of Yungkia (Wenchow) is on the southern bank of the river about 19 miles within Chi Tow. The port of Wenchow consists of Yunkia and a section of the Wu Kiang, about 2 miles long, abreast the city; the port is available to ocean-going vessels up to 350 feet long.

A tributary, the Nansi Kiang, enters through the northern bank of the Wu Kiang a short distance below the city of Yunkia.

Depths.—Vessels drawing up to 15 feet can enter the Wu Kiang and proceed to the port of Wenchow at neaps; vessels drawing up to 18 feet can do so at springs.

In 1937 the least depth in the channel leading to the port was 5 feet, according to a reliable report; in the same year a vessel drawing 21 feet 10½ inches proceeded to the port.

THE WU KIANG FROM WENCHOW FLATS TO THE PORT OF WENCHOW.—Wenchow Flats lie in the entrance to the Wu Kiang. These drying flats extend from an outer edge close northwestward of Iyu Shan (p. 407) to an inner edge about 6½ miles westward of Chi Tow (*27°59' N., 120°58' E., H. O. Chart 2546*).

Wenchow Tao (Lingkun), a low, cultivated island surrounded by a seawall, lies on the inner end of Wenchow Flats. Shwangkun Shan, a rocky islet 106 feet high, is at the western extremity of the island. About 200 yards westward of Shwangkun Shan is a rock of about the same height. Tankun Shan (Wenchow Lump), a round-topped mound 152 feet high, is on the northern shore of Wenchow Tao in a position about ¼ mile eastward of Shwangkun Shan. Several patches of red sand show through the grass covering Tankun Shan. Shwangkun Shan, Tankun Shan, and the rock westward of Shwangkun Shan, are conspicuous from the Wu Kiang entrance.

North Entrance.—North Entrance is the channel northeastward and northward of Wenchow Flats; South Entrance is the channel southwestward of Wenchow Flats. South Entrance has silted up; deep-draft vessels therefore enter the Wu Kiang through North Entrance. Both channels are subject to considerable change.

Tidal currents.—The duration of the in-going current off Chi Tow is 5½ hours; its maximum rate is 3 knots. The duration of the outgoing current is 6 hours; its maximum rate is 4½ knots.

Aids to navigation.—The navigable channel of the Wu Kiang is marked by buoys and beacons. The positions of these aids are changed frequently, and no description of them is attempted in this publication.

Northern bank.—Within a section of the northern bank of the Wu Kiang just within the entrance is an isolated range of hills. Chitow Shan, the highest part of this range, lies about 1,200 yards west-southwestward of Chi Tow; Chitow Shan is 424 feet high. A village, Hwanghwatsun, is at the western end of the range in a position about 2½ miles westward of Chi Tow. Hoyu Shan, about 2½ miles northwestward of Chi Tow, is an isolated range with a smooth-topped summit 605 feet high. About 1½ miles west-northwestward of Hoyu Shan is Shanhaw Kang, a range of reddish hills. Siaokiang Shan, about 4 miles westward of Hoyu Shan, has several trees on its summit.

The walled town of Pangshihwei is just within the northern bank of the Wu Kiang in a position about 7½ miles above Chi Tow. Lo Shan, a small rocky eminence with some trees on it, is on the northern bank abreast Pangshihwei.

The northern bank between Chi Tow and Lo Shan is fronted by a seawall; the land within the seawall is flat, except for the ranges just mentioned, and is cultivated. There are many villages.

The navigable channel between Chi Tow and Lo Shan trends along the northern bank. Between Lo Shan and a position about 6 miles above the eminence a shoal, drying in places, extends from the northern bank of the river. Jenchowtsientu and Chitutu are low, cultivated islands on the outer edge of this shoal; both islands are surrounded by a seawall. The navigable channel passes southward of the islands.

Southern bank.—Lungwan Tow is a point on the southern bank of the Wu Kiang in a position about $2\frac{1}{4}$ miles westward of Shwangkun Shan, the western extremity of Wenchow Tao. A seawall fronts several miles of the southern bank of the river upriver from Lungwan Tow; the land just within the seawall is low and cultivated. Yenshan Tsui is a point on this bank $1\frac{1}{4}$ miles westward of Lungwan Tow. Hwangshih Shan, a summit 979 feet high, is about 2 miles south-eastward of Lungwan Tow. Southward and southeastward of Yenshan Tsui the land is mountainous; Cone Peak, a conspicuous, sharp summit 1,547 feet high, lies about 3 miles southwestward of the point.

Above Lungwan Tow the navigable channel trends along the southern bank of the Wu Kiang.

PORT OF WENCHOW ($28^{\circ}02' N.$, $120^{\circ}39' E.$, plan on H. O. Chart 2546).—The lower harbor limit is about 4 miles above the upriver extremity of Chitutu; the upper harbor limit, about 2 miles above the lower limit, is abreast the entrance to a creek flowing through the southern bank of the Wu Kiang in a position about 800 yards westward of the northwestern corner of the wall enclosing the city of Yunkia.

Islands and dangers.—Linkiaotsien, an island about 1,100 yards long and 325 yards wide, lies near the outer edge of a drying flat extending from the northern shore of the harbor. The island is abreast the northeastern corner of the city wall. Linkiaotsien is awash at high water springs.

Kiangsinsze, an islet about $\frac{1}{4}$ mile long and 150 yards wide, is about 400 yards off the western part of the city wall. The islet rises from a drying flat. There are pagodas near the eastern and western extremities of the islet. Foul ground extends about 200 yards north-eastward from the northeastern side of the islet; the least depth over this foul ground is 3 feet. A drying sand bank extends from the south-eastern side of Kiangsinsze over halfway across the channel between the eastern end of the islet and the customhouse on the southern bank of the river; the customhouse is in about the center of the northern wall of the city. The depths in the remaining part of the channel are not more than 4 feet.

Elephant Rock, drying 10 feet, lies near the outer edge of the sand bank in a position about 200 yards southeastward of the eastern end

of Kiangsinsze. A **light** (see Light List) is shown from a red iron beacon with a white band, surmounted by a spherical cage, on Elephant Rock.

Berthing regulations.—Vessels entering the harbor will be boarded by a berthing officer, who will direct them to proper berths.

Vessels shall moor in accordance with instructions from the harbor master, and shall not shift berth without special permission, except when outward bound after having obtained their clearance papers.

Application for berths, or for permission to shift berths, must be made at the harbor master's office by the master, the first officer, or the pilot in charge, when the necessary instructions concerning the berth will be given. If a vessel is instructed to shift her berth by the harbor master, she must do so.

Anchorage for vessels laden with dangerous cargo.—Vessels laden with petroleum products or explosives must anchor below the lower harbor limit. The prescribed area, shown in dashed lines on the chart, extends approximately from abreast the eastern bank of the Nansi Kiang to a limit about $1\frac{1}{4}$ miles downriver.

Quarantine anchorage—Regulations.—The quarantine anchorage is below the anchorage for vessels laden with dangerous cargo.

Vessels having an infectious disease on board, or any disease suspected to be infectious, or the body of a person who has died, or is suspected of having died, of an infectious disease, shall, on approaching the port, hoist the quarantine flag, anchor in the quarantine anchorage, and keep the quarantine flag flying until pratique has been granted. No person is permitted to board or leave such a vessel without a permit from the harbor master or the port health officer.

Landing places.—Boats can land at a stone slip abreast the customhouse. The customhouse is on the southern bank of the river in a position southeastward of the eastern extremity of Kiangsinsze.

Boats can also land at a pontoon, alongside which the depth is 3 feet, situated nearly 1 mile below the customhouse on the same bank of the river.

Port signals.—The system of port signals in use in the port of Wenchow is described on page 41.

Typhoon signals.—Typhoon signals are hoisted on a flagstaff at the customhouse. The signals and their meanings are as follows:

Signal	Meaning
A triangular shape with apex upward	Typhoon within 400 miles of Yunkia.
A square shape	Typhoon within 200 miles of Yunkia.
A circular shape	Typhoon threatening Yunkia.
A triangular shape with apex downward	Typhoon passed.

The meteorological information according to which these signals are displayed is received by telegraph from Shanghai. At times the receipt of a typhoon warning signal is often delayed by the typhoon

itself. The signal for a typhoon threatening Yunkia is hoisted, independently of a message from Shanghai, when a barometer in the customhouse indicates a probable typhoon; the critical reading is 29.65 inches or lower.

Vessels in the harbor should prepare to get steam up at short notice when the first signal of the above list is displayed.

Tides—Tidal currents.—In the port of Wenchow the average duration of the flood tide is 4¾ hours, and that of the ebb is 7½ hours. The tidal currents continue for about 38 minutes after the times of high and low water. During freshets, which occur after heavy rains in April, May, and June, the out-going current sometimes runs for a whole day, and may attain a rate of 6 knots.

Pilots.—Application for a pilot should be made, as far in advance as practicable, to the harbor master of the port of Wenchow in Yunkia. The pilots are members of the local customs staff; no licensed pilots are available. The pilots meet vessels off Chi Tow. It is reported that it is unsafe to proceed farther toward the Wu Kiang entrance than the anchorage off Tsingling Yu (p. 409); this report states further that vessels can arrange to meet the pilot at that anchorage.

YUNKIA (WENCHOW) (28°01' N., 120°39' E., *H. O. Chart 2546*).—The headquarters of the Wenchow Customs District is in Yunkia. Considerable numbers of overseas vessels visit the port; native craft, including power vessels, plying the system of inland waters proceed to Yunkia in great numbers.

The wall enclosing this ancient city is about 4 miles in perimeter. The town of Kiangsintu is on the northern bank of the Wu Kiang abreast Yunkia.

In 1937 the population of Yunkia was about 120,000.

Wharves.—Five wharves available to shipping have a total frontage of about 477 feet; the depths alongside are 12 feet and more; the largest wharf has a frontage of 164 feet, and a depth alongside of 20 feet.

Supplies.—Small quantities of fresh provisions are obtainable.

Fuel oil is obtainable in moderate quantities.

Unlimited quantities of good quality drinking water are available; the water is delivered in buckets by sampanmen.

Communications.—There is regular communication by steamer with Shanghai, Ningpo, Hongkong, and other ports.

Yunkia is connected with the general telegraph system of China; telegrams can be relayed to countries overseas. There is long distance telephone service to Shanghai and other cities.

Health.—Yunkia is considered a reasonably healthful city; cholera, ague, ophthalmia, and smallpox are generally confined to the native section of the city. The most healthful months are from December to February, inclusive; the least healthful months are June and July.

Hospitals.—Two hospitals in Yunkia have 170 or more beds each; there are 10 smaller hospitals.

COAST FROM THE WU KIANG ENTRANCE TO TANUE POINT (*H. O. Chart 3179*).—The coast between the Wu Kiang entrance and Tanue Point, about 36 miles south-southwestward, is fronted by a shoal mud bank. In places this bank dries as far as 6 miles from the coast.

The Feiyun Kiang and the Ao Kiang enter the sea along this section of coast.

Coast.—Siau pi Point (27°49' N., 120°44' E., *H. O. Chart 3179*) lies about 7 miles southward of Cone Peak. A mud flat dries as far

as 5 miles off the coast between the point and the Wu Kiang entrance to the northeastward. Kin vang Head is a point about 11 miles south-southeastward of Siau pi Point.

Feiyun Kiang.—The entrance to the Feiyun Kiang (Juian Ho) (Shwin gan River) is between Siau pi Point and Kin vang Point. A bar across the entrance has over it a depth of 9 feet. The four Tsang Islands lie on the northern side of the approach to the Feiyun Kiang; the southernmost and largest of the Tsang Islands is on the northern side of the passage over the bar. The Tsang Islands, and numerous islets between them and the coast, are all within the 3-fathom curve.

Port of Juian (27°40' N., 120°30' E.).—The town of Juian, with a population of about 20,000, is on the northern bank of the Feiyun Kiang; the port off the town affords anchorage to vessels drawing up to 12 feet. A wharf is available. Steamers on the Shanghai-Kuaotou run call regularly.

Coast.—From Kin vang Head to Pingyang Point, about 12 miles southward, the coast consists of a wide bight nearly filled by a drying flat. A black spherical buoy, surmounted by a sphere, lies about 8½ miles east-southeastward of Kin vang Head. This privately maintained buoy marks the approach to the Ao Kiang.

Ao Kiang—Port of Kuaotou.—The Ao Kiang flows into the head of the bight between Kin vang Point and Pingyang Point. The town of Kuaotou, with a population of 15,000 to 20,000, lies on the northern bank of the river a short distance within the entrance.

The port of Kuaotou (27°36' N., 120°33' E.) lies off the town. Vessels drawing up to 10 feet can enter the port and anchor. Limited amounts of fuel are obtainable. There are telegraph and long distance telephone offices in the town.

Coast.—Tanue Point lies about 6 miles south-southwestward of Pingyang Point. A rock awash lies about ¼ mile southward of Tanue Point; several rocks above water lie ¼ mile southwestward of the point. Farmer Rock lies about 4 miles northeastward of Tanue Point; Farmer Rock dries.

OFF-LYING ISLANDS AND DANGERS (*H. O. Charts 2546 and 3179*).—Numerous islands and dangers lie off the coast between the Wu Kiang and Tanue Point. Those northward of Tungse Shan, the southernmost of the Tse Islands, or northward of the parallel of latitude 27°46' N., are described in the section on the approaches to the Wu Kiang.

Islets and dangers between the Tse Islands and Pehkishan Liehtao.—Mu Tao (27°45' N., 121°10' E., *H. O. Chart 2546*) is an islet lying about 1¼ miles southeastward of the southeastern side of Tungse Shan. Fu Tao lies close southwestward of Mu Tao; Tze Tao lies close southwestward of Fu Tao. Several rocks lie close off

these islets. Siawu Kiao, a rock 20 feet high, lies 1 mile southeastward of Mu Tao.

Mo Tao and Ke Tao, the latter close southward of Mo Tao, lie westward of the group consisting of Mu Tao, Fu Tao, and Tze Tao; the fairway through the intervening channel is about $\frac{1}{4}$ mile wide, and has depths of 5 to 9 fathoms. The fairway through the channel between Mo Tao and the foul ground extending southeastward from Tungste Shan is about 600 yards wide, and has depths of about 5 fathoms.

Wangtiao Kiao, a reef awash, lies about $\frac{1}{2}$ mile southward of the southern extremity of Nantse Shan. Niu Kiao, a rock over which the depth is 2 fathoms, lies nearly 2 miles southwestward of the same extremity. Hu Yu, an islet 37 feet high, lies about $1\frac{1}{2}$ miles south-southwestward of the southern extremity of Nantse Shan. Hufen Kiao, a reef drying 12 feet, lies about 1,100 yards eastward of Hu Yu.

Kwakwa Yu, an islet $3\frac{1}{2}$ miles southward of the southern extremity of Nantse Shan, consists of two portions; the northern and higher portion is 194 feet high. Foul ground extends about 400 yards southward from the southern extremity of Kwakwa Yu. Futing, a rock 16 feet high, lies about 1 mile west-southwestward of Kwakwa Yu.

Kuei Kiao, a reef drying 2 feet, lies about $1\frac{1}{4}$ miles east-northeastward of Kwakwa Yu. Nanpai Yu, a low islet, lies nearly 2 miles northeastward of Kwakwa Yu. Pehpai Yu is an islet lying $\frac{1}{2}$ mile eastward of Nanpai Yu. Sheng Kiao, a rock with a depth of 1 fathom over it, lies nearly 600 yards north-northwestward of Pehpai Yu.

Tapeh Liehtao.—Tungpang Shan ($27^{\circ}43' N.$, $120^{\circ}53' E.$, *H. O. Chart 2546*), the northwesternmost of the islands forming Tapeh Liehtao, is 199 feet high.

Changtai Shan, an island 275 feet high, lies southeastward of Tungpang Shan; in the middle of the intervening channel, which is about 800 yards wide, is Shanchi Yu, an islet 87 feet high. Rocks, some of which dry, extend as far as 800 yards from the eastern side of Changtai Shan. Kinchi Yu, an islet 86 feet high, lies about 1,100 yards north-northeastward of the northeastern extremity of Changtai Shan.

Hengliang Shan is an island close off the southeastern extremity of Changtai Shan. An islet is close off the northwestern extremity of Hengliang Shan.

Lichih Shan, 232 feet high, is the southeasternmost of the Tapeh islands. Lichih Shan is close southward of Hengliang Shan.

Anchorage.—Small vessels can obtain sheltered anchorage, during the northeast monsoon, southwestward of Tapeh Liehtao in depths of $3\frac{1}{2}$ to 4 fathoms.

Tungpwan Islands.—This group consists of a large island, Pehlung Shan, and several smaller islands. The group lies within a distance of 4 miles southeastward of Lichih Shan.

Pehlung Shan attains a height of 652 feet in a summit in about the center of the island. Rocks lie close off the shore in many places around the island; Losze Yu, a rock 30 feet high, lies close off the northern extremity of Pehlung Shan.

Lungchu is an islet about 700 yards westward of Pehlung Shan. Rocks extend about 200 yards from the northern and western sides of Lungchu.

Tatsung Shan, Siaotsung Shan, Tachih Shan, Siaoehih Shan, and a few smaller islets and rocks, lie within a distance of $2\frac{1}{2}$ miles westward and southwestward of Pehlung Shan.

Anchorage.—Vessels with local knowledge can anchor in a depth of about 7 fathoms between the southwestern side of Pehlung Shan and the smaller islands to the westward.

Tungkwa Yu (Shroud Island) lies about $4\frac{1}{2}$ miles east-southeastward of Pehlung Shan. The western side of the island is a conspicuous bluff. Foul ground, from which rise three islets, extends over $\frac{1}{2}$ mile westward and northwestward from Tungkwa Yu. A rock above water and a rock awash lie close together just off the southern extremity of the island. Chuentiao, a rock over which the depth is $2\frac{3}{4}$ fathoms, lies about $\frac{1}{2}$ mile southward of this extremity.

A **light** (see Light List) is shown from a white circular tower, 26 feet high, near the western extremity of Tungkwa Yu.

Nan Chih, an islet 56 feet high, lies about $2\frac{1}{4}$ miles north-northwestward of Tungkwa Yu. Foul ground extends about 400 yards north-northeastward from Nan Chih.

Penki Yu and nearby islets and dangers.—Penki Yu ($27^{\circ}39' N.$, $121^{\circ}11' E.$, *H. O. Chart 2546*) is an island lying about $3\frac{3}{4}$ miles southeastward of Kwakwa Yu.

Tung Sing, a rock drying 18 feet, lies about $\frac{1}{2}$ mile eastward of the northern extremity of Penki Yu.

Niupi Shan, an islet much smaller than Penki Yu, lies northward of the latter; the intervening channel is about $\frac{1}{4}$ mile wide between banks, with depths less than 3 fathoms, extending from the shores of Niupi Shan and Penki Yu. The depths in the channel are 12 to 14 fathoms.

Peh Sing, a rock drying 18 feet, lies about 400 yards northward of Niupi Shan.

Si Sing, a rock drying 10 feet, lies about $1\frac{1}{4}$ miles westward of Penki Yu.

Pehkishan Liehtao.—Pehkishan (Pi ki Shan) lies with its northeastern extremity about $1\frac{3}{4}$ miles southeastward of Penki Yu. Pehkishan is the largest island of the group, Pehkishan Liehtao. A summit in about the center of the island is 360 feet high. The channel between Pehkishan and the westernmost island of the group, which is also the island farthest from Pehkishan, is about $\frac{3}{4}$ mile wide; there

are rocks in the approaches to this channel, and also in the channel itself. An islet, surrounded by rocks, lies $1\frac{3}{4}$ miles westward of the westernmost island of Pehkishan Liehtao.

Nam ki ($27^{\circ}28' N.$, $121^{\circ}04' E.$, *H. O. Chart 3179*) is a large island lying with its western extremity about 20 miles eastward of Pingyang Point on the mainland. A summit near the western extremity of the island is 740 feet high. Nam ki is the largest island of a rather compact group. Reefs lie as far as 3 miles from the southwestern side of the island; there are reefs close around the other islands in the group. In 1939 fishing stakes were reported extending as far as 5 miles from the eastern side of the island.

Port Nam ki is an indentation in the southeastern side of Nam ki; a swell rolls in during the northeast monsoon, and also with southeasterly winds.



Nam ki bearing northwestward, distant 17 miles.

Anchorage.—Vessels with local knowledge can anchor in a bay on the northwestern side of Nam ki; the western extremity of the island is the southern point of the entrance to this bay. Junks frequent this anchorage.

Turret Islet, a small conical islet, lies about $4\frac{1}{4}$ miles westward of the western extremity of Nam ki; reefs lie $\frac{1}{4}$ mile northward of Turret Islet, and also $\frac{3}{4}$ mile westward.

Castellated Rock is about 18 miles eastward of Tanue Point. The rock appears double on some bearings.

COAST AND OFF-LYING ISLANDS FROM TANUE POINT TO NAMKWAN POINT (*H. O. Chart 3179*).—Namkwan Point is a point about 16 miles south-southwestward of Tanue Point. The intervening coast consists of several bights with irregular shores.

Pi kwan Harbor, between two islands close off the coast, is a useful typhoon refuge for small vessels; Namkwan Bay, of which Namkwan Point is the western entrance point, is shallow, but deep-draft vessels can anchor near its entrance.

Coast.—Nob Point ($27^{\circ}18' N.$, $120^{\circ}34' E.$, *H. O. Chart 3179*) is about 6 miles southwestward of Tanue Point. The coast between these points forms Tanue Bay, an extensive indentation with depths of less than 2 fathoms.

Gap Islet, a low rock, lies about $1\frac{1}{2}$ miles southward of Tanue Point. Keun Island lies in about the middle of the entrance to Tanue Bay.

Pi kwan Peak, nearly 6 miles westward of Nob Point, is a high, conical hill with a sharp, conspicuous summit.

Toe Point lies about $3\frac{1}{4}$ miles southward of Nob Point. The outer portion of Toe Point is nearly detached.

Kwan Head is about 3 miles south-southwestward of Toe Point. The coast forms a bay between Kwan Head and Toe Point.

Off-lying islands.—Ping fong Island lies with its northern extremity about 2 miles southward of Kwan Head. The island is about $1\frac{3}{4}$ miles long in a north and south direction and is nearly 1 mile wide. A rock above water, with a sunken rock close westward of it, lies about 1 mile eastward of the southern extremity of Ping fong Island. An islet, with a sunken rock off its eastern extremity, lies close off the northeastern extremity of the island. Vessels should pass eastward of these dangers. There is also a sunken rock close off the southwestern extremity of Ping fong Island; this extremity should not be approached closer than $\frac{1}{4}$ mile.

Pi Pass, the channel between the northern end of Ping fong Island and the mainland to the northwestward, is obstructed by several islets and rocks.

Chin kwan Island is about $1\frac{3}{4}$ miles long in a northwest and southeast direction; the island is very narrow. It lies with the southeastern extremity about 2 miles west-southwestward of the southern extremity of Ping fong Island. A reef extends about 200 yards southward from the southern extremity of Chin kwan Island; a reef extends nearly 300 yards from an islet close off the southwestern extremity of the island.

Pi kwan Harbor ($27^{\circ}10' N.$, $120^{\circ}30' E.$, *H. O. Chart 3179*).—This harbor lies between Ping fong Island to the eastward, Chin kwan Island to the westward, and the mainland to the northward. A red conical buoy, privately maintained, is moored in the entrance to the harbor in a position about $\frac{1}{2}$ mile eastward of the southern extremity of Chin kwan Island. A shoal with a depth of less than 3 fathoms lies in the entrance in a position about $\frac{3}{4}$ mile southwestward of the southwestern extremity of Ping fong Island.

Pi kwan Harbor affords good anchorage in the northeast monsoon to vessels with local knowledge drawing less than 15 feet. The harbor is available in a typhoon.

Namkwan Bay.—Namkwan Point lies about 2 miles westward of the northwestern extremity of Chin kwan Island. Between the point and this extremity is the entrance to Namkwan Bay. The depths in the bay shoal abruptly just within the entrance; the bay is very

shallow. The walled town of Namkwan is on the northern shore of the bay.

Vessels can obtain anchorage, in depths of 7 to 10 fathoms, off the southwestern side of Chin kwan Island in a position northward of the second islet from the southern end of the island.

NAMKWAN HARBOR (*H. O. Chart 3208*) is a narrow inlet entered westward of Namkwan Point. The harbor is a useful typhoon refuge; deep-draft vessels can obtain anchorage just within the entrance. The inlet trends in a general northwesterly direction about 13 miles between high hills, and opens into a wide basin that has not been surveyed.

Entrance.—Fukien (Fuhkien) Head ($27^{\circ}10' N.$, $120^{\circ}26' E.$, *H. O. Chart 3208*), the southern point of the entrance to Namkwan Harbor, is slightly more than $\frac{3}{4}$ mile southward of Namkwan Point. The northern side of the entrance is a section of coast, about $1\frac{1}{4}$ miles long, between Namkwan Point and Town Point to the west-southwestward. Town Point forms the southern side of Town Bay, at the head of which is a village.

There are many fishing nets off the entrance to Namkwan Harbor; the harbor itself is greatly obstructed by nets and bamboo moorings laid for sampans.

The fairway through the entrance channel is deep, although the depths are irregular.

Vessels should not proceed farther into Namkwan Harbor than Tree Islet, about $1\frac{1}{4}$ miles above Town Point.

Islets and dangers in Namkwan Harbor.—Bate Islet lies close off Town Point. A drying rocky reef extends about 400 yards northwestward from the islet. A depth of 5 fathoms was reported (1927) in a position about 1,100 yards southward of Bate Islet. A 7-fathom patch was reported (1908) about 400 yards southwestward of the islet. A rock, over which the depth is $4\frac{1}{2}$ fathoms, was reported (1908) in a position about 1,400 yards northwestward of Bate Islet.

The deep channel passes westward of this rock, and also westward of Tree Islet, which lies nearly $1\frac{3}{4}$ miles northwestward of Bate Islet. A mud bank extends from the eastern side of the harbor in this vicinity.

Kin sho Islet lies nearly $2\frac{1}{2}$ miles above Tree Islet and equidistant from either shore of the harbor. A drying rock lies close off the southwestern side of Kin sho Islet; a reef awash lies about 300 yards off its eastern side.

An island extends nearly across Namkwan Harbor from a position close off a point on the northern shore about 5 miles above Kin Sho Islet. A rock above water lies about 300 yards eastward of the southeastern extremity of this island; a rock awash lies about 200 yards southeastward of the rock above water.

Anchorage.—The depths in an anchorage northwestward of Bate Islet are 14 fathoms.

Small vessels can anchor 400 to 1,200 yards southeastward of Tree Islet; the depths are $3\frac{1}{4}$ to 5 fathoms, and the bottom is soft mud.

In 1936 a British naval vessel anchored with Namkwan Point bearing 20° , distant 1,000 yards. The anchor was weighed the next day with difficulty, and it was thought that the bottom here was rocky.

Tides.—The mean high water interval in Namkwan Harbor is 9h. 50m.; the mean range is 13.8 feet, and the spring range is 17.2 feet.

COAST FROM NAMKWAN HARBOR TO FUNING BAY (*H. O. Chart 3179*).—From Fukien Head, the southern point of the entrance to Namkwan Harbor, the coast trends irregularly southwestward. This section is practically a series of bays with irregular shores. The bays are generally shallow; not all of them have been thoroughly examined. Funing Bay is entered southward of a point about 19 miles southwestward of Fukien Head.

Coast.—Mortice Bluff is an island nearly joined to the mainland in a position about 4 miles southwestward of Fukien Head; the channel intervening between Mortice Bluff and the mainland is occupied by an islet, past either side of which is a narrow boat channel.

Angle Island (p. 422) is close off a point on the coast about $13\frac{1}{2}$ miles southwestward of Mortice Bluff. Tchinkoen Bay and Lishan Bay, along this section, have not been thoroughly examined. A rock drying 5 feet lies about 800 yards southward of the southern point of the entrance to Lishan Bay, the southwestern bay. A rock awash is about 400 yards northeastward of the same point.

Funing Bay.—The northern point of the entrance to Funing Bay is about $3\frac{1}{2}$ miles southwestward of this point. The southern point of the entrance to Funing Bay is Fielon Island, about 7 miles south-southwestward of the northern point of the entrance. Fielon Island is close off a point on the mainland. Funing Bay has only been partially examined; it appears to be shoal. There are several islets and rocks in it. Funingfu is a town at the head of Funing Bay. Fong ho, about $1\frac{1}{4}$ miles southward of the northern point of the entrance to the bay, is the largest and southeasternmost of several islets lying in the northern part of Funing Bay. Sansha, a large fishing village, is on the northern shore of the bay just within the northern entrance point. Sansha Islet, with a ruined castle on its summit, is just off the village.

Anchorage in Funing Bay.—Good anchorage has been obtained off the village of Sansha, in a depth of $4\frac{1}{2}$ fathoms, with the northern entrance point of the bay bearing 43° , distant 700 yards.

In 1931 a British naval vessel passed $\frac{1}{2}$ mile northward of Fong ho on a westerly course; this vessel then approached the anchor-

age off Sansha village on a course of 3° , with Sansha Islet just on the port bow.

Off-lying islands and dangers.—Fu yan is the easternmost and largest of a group of islands lying within a distance of 10 miles eastward of the northern point of the entrance to Funing Bay. Fu yan is nearly 4 miles long in an east and west direction and about $2\frac{1}{2}$ miles wide. A summit in about the center of the island is 1,700 feet high.

Angle Island, the westernmost island of the group, is separated from the mainland by Little Pass, a narrow channel somewhat obstructed by rocks. The fairway through the channel has a least depth of 5 fathoms. One vessel can obtain good anchorage in the southern part of Little Pass in a depth of 9 fathoms. This anchorage is a useful typhoon refuge.

Chupi Island lies eastward of Angle Island. Chupi Pass, the channel between the islands, is about 1 mile wide; the fairway through the southern part of the pass is reduced to a width of about $\frac{1}{2}$ mile by a group of low rocks lying about $\frac{1}{2}$ mile southeastward of Angle Island. Sugarloaf Islet lies close off the southern side of Chupi Island.

Fu yan Pass is the narrow channel between Chupi Island and Fu yan to the eastward. The depths in Fu yan Pass are 7 to 9 fathoms; the eddies are strong in the pass and it is not nearly as desirable as Chupi Pass or Little Pass, particularly during heavy squalls. Moreover, it is considerably obstructed by fishing stakes. Large numbers of fishing stakes extend northward and northwestward from the northern shore of Fu yan.

Anchorage—Caution.—It is reported that good anchorage can be obtained 1 mile westward of Fu yan. The depth is 6 fathoms, and the bottom is sand.

A British naval vessel obtained good anchorage in a position with the eastern extremity of the island bearing 180° , distant 1 mile; the depth was 6 fathoms.

Depths of 3 fathoms were reported (1908) northward of Chupi Island, and between Fu yan and the mainland, where the chart shows depths of 5 fathoms. A British naval vessel reported (1931) less depths than charted about 2 miles northward of Fu yan over an area with a radius of 1 mile.

OUTLYING ISLANDS AND DANGERS (*H. O. Chart 3179*).—

There are three groups of islands and dangers off the coast between Namkwan Harbor and Funing Bay. The outermost group, the Seven Stars, lies nearly 25 miles from the mainland. The middle group consists of the Tae Islands. The Incog Islands, the innermost

group, are from 5 to 7 miles northeastward of Fu yan. There are also isolated islets and dangers.

The Seven Stars are a group of islets and rocks. The southwesternmost and largest islet ($27^{\circ}03' N.$, $120^{\circ}50' E.$, *H. O. Chart 3179*) is about 200 feet high, and is split in two. A rock awash lies about 600 yards westward of this islet. Another of the group, a rugged islet, lies about 1 mile northeastward of the largest islet, and is 70 feet high. About the same distance farther northeastward are three low, flat rocks, with smaller rocks around them; the easternmost of the three flat rocks dries.

Cleft Rock, 50 feet high, is an isolated danger about 3 miles north-northwestward of the 200-foot islet of the Seven Stars.

The Tae Islands, two islands and a number of rocks, lie from 7 to 9 miles west-southwestward of the Seven Stars. The two islands are of nearly the same size and are close together. The southeastern island has a flat summit about 400 feet high. Mushroom Rock, close off the northeastern extremity of the northwestern island, is 260 feet high. An islet, 103 feet high, lies about 1 mile westward of the southern extremity of the northwestern island. A reef awash, with a rock 30 feet high on it, lies about 1 mile westward of the northern extremity of this island, and another reef awash lies about 1 mile farther westward. Another reef awash lies about $4\frac{1}{4}$ miles northwestward of the same island.

The area some distance westward of the Tae Islands has not been surveyed.

Strawstack Islet, an isolated rocky islet 300 feet high, is about 3 miles south-southwestward of the southeastern Tae Island. A small islet lies close northwestward of Strawstack Islet.

A rock awash was reported in a position approximately $4\frac{1}{2}$ miles westward of Strawstack Islet. A British naval vessel passed (1903) within $\frac{1}{2}$ mile of this position; a heavy easterly swell was running, but no indication of this rock was seen.

Incog Islands.—The easternmost and largest of the Incog Islands lies about 11 miles west-northwestward of Strawstack Islet. This island is 150 feet high. An islet, 120 feet high, with rocks nearby, lies close southward of the easternmost island. The westernmost island is about $1\frac{1}{4}$ miles northwestward of the 150-foot island. **Incog Islands Light** (see Light List) is shown from a white circular tower, 61 feet high, on the western extremity of the westernmost Incog Island.

Vessels passing between the Incog Islands and the Tae Islands should keep well towards the western side of the passage.

Anchorage.—In the northeast monsoon vessels with local knowledge can anchor about 400 yards off the southwestern side of the westernmost Incog Island. The depth is 6 fathoms, and the

bottom is mud. Two white masts in range and bearing 58° lead toward the anchorage.

Vessels can also anchor northwestward of this island in a depth of 7 fathoms. The recommended position is at the intersection of two ranges consisting of two pairs of marks, surmounted by shapes, situated eastward and westward, respectively, of the lighthouse.

Solitary Rock, about $3\frac{1}{2}$ miles northwestward of the westernmost Incog Island, is 200 feet high. A reef extends about 400 yards eastward from the rock. The channel between Solitary Rock and the Incog Islands is safe.

Dangerous Rock, about $7\frac{1}{2}$ miles south-southeastward of the easternmost Incog Island, is 8 feet high.

COAST FROM FUNING BAY TO SAMSA INLET (*H. O. Chart 2556*).—From the point on the mainland abreast Fielon Island, the southern point of the entrance to Funing Bay, to Chown Point, about 22 miles southwestward, the coast is rugged. There are numerous bays. Portions of this section of coast have not been thoroughly examined.

The southwestern portion of this section of coast forms the southeastern side of Tungchung Peninsula; the northwestern side of the peninsula fronts Samsa Basin (p. 431) and the channel leading to the basin. Tungchung Peninsula is rugged and broken; masses of granite are piled up on the hills. The peninsula is connected to the mainland by a narrow, hilly isthmus.

Coast.—Goodridge Point ($26^\circ 44' N.$, $120^\circ 09' E.$, *H. O. Chart 2556*) lies about $4\frac{1}{2}$ miles south-southeastward of the point abreast Fielon Island. The coast is indented between these points. There are several islets and rocks in the bay; the chart is the best guide concerning these. Some islets lie off Goodridge Point.

Stone Point is about $4\frac{3}{4}$ miles south-southwestward of Goodridge Point. The bay between the points has been only partially examined. Bittern Island lies near the head of the bay. A small sandy cove indents the shore of the bay westward of the northern part of Bittern Island. A small vessel with local knowledge can obtain anchorage, sheltered in either monsoon, between this cove and Bittern Island in a depth of $3\frac{1}{2}$ fathoms. Care is necessary in approaching this anchorage; there may be dangers other than shown on the chart. Some islets lie off Stone Point.

Cox Point is about 12 miles southwestward of Stone Point. The intervening coast has been only partially examined. Sphinx Head lies near the shore of the wide bight between the two points in a position about 5 miles westward of Stone Point; a boulder on the eastern slope of Sphinx Head is conspicuous.

Chown Point, the eastern point of the entrance to Samsa Inlet, is

nearly $4\frac{1}{2}$ miles southwestward of Cox Point. The intervening coast is rugged.

Off-lying islands—Channels.—Flat Island lies abreast a point on the coast about $2\frac{3}{4}$ miles southwestward of Stone Point. The channel between the coast and the island is about 800 yards wide, and is obstructed by an islet; passage through this channel should not be attempted. Flat Island is low and flat. A rock above water and a sunken rock lie close off its southwestern extremity. During the northeast monsoon small vessels with local knowledge can obtain sheltered anchorage off a sandy bay in the coast about $1\frac{1}{2}$ miles northwestward of Flat Island.

Double Peak (Fohing) Island lies with its northern extremity about $2\frac{1}{2}$ miles eastward of Flat Island. The island is about $3\frac{1}{4}$ miles long, and about $1\frac{1}{2}$ miles wide. The highest of two remarkable peaks near the northeastern extremity of the island is 1,190 feet high. Channel Rock lies about $\frac{3}{4}$ mile northwestward of the western extremity of Double Peak Island; a rock above water lies about 200 yards off the northwestern shore of the island in a position about 1 mile eastward of Channel Rock. The depths as far as 1 mile southwestward from the southwestern shore of the island are less than 5 fathoms; depths less than charted were reported (1935) 2 miles southwestward of Channel Rock.

Nageu Seu and Ma Chick are two hilly islets close off the southern end of Double Peak Island; the islets have not been thoroughly examined. In the northeast monsoon, good anchorage can be obtained southwestward of Double Peak Island; the anchorage is sheltered from the easterly swell by Nageu Seu and Ma Chick.

Seacon Channel is a passage about 2 miles wide between Double Peak Island and the mainland to the northwestward. The channel is deep, and is clear except for Flat Island.

Inside Islet lies about $1\frac{1}{4}$ miles east-southeastward of Cox Point. Isthmus Island lies with its northern extremity about $1\frac{1}{2}$ miles eastward of Inside Islet. Isthmus Island is divided into a northern portion and a southern portion by a sandy isthmus. A mud bank, with depths over it of less than 3 fathoms, extends about $\frac{1}{2}$ mile southwestward from the southwestern side of the southern portion. The northern part of the channel between Isthmus Island and Inside Islet is obstructed by a reef from which rise several rocks drying 5 to 6 feet. The channel, about 1 mile wide, between Isthmus Island and an islet to the southeastward appears to be clear and deep.

Outlying islands.—The Pi Seang (Tsi sing) Islands lie within a distance of $13\frac{1}{2}$ miles northeastward of Double Peak Island. Town Island ($26^\circ 42' N.$, $120^\circ 21' E.$, *H. O. Chart 3179*) is the northernmost and largest of this group of islands and rocks. A small cove on the southwestern side of Town Island affords shelter to small vessels. The

southernmost island, Country Island, is nearly 4 miles southward of Town Island; Country Island is about 400 feet high. The easternmost of the Pi Seang Islands lies about $2\frac{1}{2}$ miles north-northeastward of Country Island. A reef, on which is a rock drying 6 feet, extends about $\frac{1}{2}$ mile northeastward from the easternmost island; the reef is marked by breakers. Bare Rock lies about $1\frac{1}{4}$ miles southwestward of Country Island; there are several rocks northwestward of Bare Rock.

SAMSA INLET (*H. O. Chart 2556*).—Samsa Inlet (Santu Ao) (Port of Santuao) is an extensive body of water entered through a channel, about $1\frac{1}{2}$ miles wide, southwestward of the southwestern end of Tungchung Peninsula. The entrance channel opens into a wide basin obstructed by numerous islands.

The shores of the inlet are hilly; there are numerous ranges of mountains. The land in the vicinity is extensively cultivated; the hills are terraced.

Samsa Inlet is readily accessible in all weathers. It is a convenient typhoon refuge; deep-draft vessels can anchor over good holding ground. With strong northeasterly winds a heavy sea rolls in through the entrance, and with the outgoing current there are heavy tide rips. With easterly winds and a strong outgoing current deep-draft vessels become tide-rod.

ISLANDS AND DANGERS IN THE APPROACH TO SAMSA INLET.—**Cony Island** ($26^{\circ}30' N.$, $120^{\circ}08' E.$, *H. O. Chart 2556*), about 2 miles southward of Ma Chick, has a conical summit 742 feet high. A reef extends about 600 yards northward from the northern extremity of the island. A rock awash lies about $\frac{3}{4}$ mile eastward of the island, and a similar rock lies slightly more than 1 mile southeastward of the island. A $5\frac{1}{2}$ -fathom patch lies about $\frac{1}{2}$ mile westward of the latter rock. A rock awash lies about 5 miles southeastward of Cony Island.

Black Rock, 70 feet high, lies about $6\frac{3}{4}$ miles south-southwestward of the southern extremity of Cony Island. The water northward of Black Rock is discolored. Bamboo ropes, connecting floating stakes to fish traps, are laid westward and southwestward of Black Rock.

Spider (Sojong) Island lies with its northeastern extremity about $3\frac{1}{2}$ miles west-northwestward of Cony Island. Three islets lie close off the northeastern side of Spider Island. Some rocks and islets lie off the northern side of the island. **Spider Island Light** (see Light List) is shown from a white circular tower, 53 feet high, on the southernmost of the three islets off the northeastern side of Spider Island; the keeper's dwelling is white. Halftide Rock lies about 1,200 yards north-northeastward of the western extremity of Spider Island.

Larva Rocks, consisting of several rocks above water and below water, lie westward of Spider Island. The southeasternmost rock is about $1\frac{3}{4}$ miles westward of the southwestern extremity of the latter island. The northwesternmost rock is about 2 miles distant from the southeasternmost rock.

SAMSA INLET—APPROACH TO THE PORT OF SANTUAO (*H. O. Chart 2556*).—The port of Santuao, within Samsa Inlet, is reached by proceeding through the entrance channel and then through Waterwitch Channel, which branches off to the northwestward from the inner end of the entrance channel. Waterwitch Channel leads to Santuao Anchorage; the town of Santuao, on the southern shore of Santuao Island, fronts the anchorage.

The port of Santuao is readily accessible in all weathers, but with strong northeasterly winds a heavy sea rolls in through the entrance; with the outgoing current there are heavy tide rips.

Depths.—The fairway through the entrance channel and through Waterwitch Channel is deep.

Northern side of entrance channel.—Chown Point ($26^{\circ}31' N.$, $119^{\circ}53' E.$, *H. O. Chart 2557*) is the eastern point of the entrance to Samsa Inlet. The northern shore of the channel between Chown Point and Castle Point, about 3 miles west-northwestward, is rugged and steep-to. The tidal currents are felt only slightly off this section of the shore.

Castle Point is steep-to. The point forms the northern side of a small bay that is filled by a mud flat. Mount Sing Ting, 1,515 feet high, is about $1\frac{1}{2}$ miles east-northeastward of Castle Point, and has a flat top on which are several large boulders. The tidal currents off Castle Point attain a rate of 4 to 7 knots; there are generally heavy tide rips off the point, especially with the outgoing current.

Ridge Point lies about $3\frac{1}{2}$ miles northward of Castle Point; the eastern shore of Tungchung Peninsula between these points consists of inlets filled by mud flats. There is a village at the head of each inlet; the valley behind each village is cultivated.

Tungchung is a town at the head of the inlet immediately southward of Ridge Point. A customs substation is located in the town.

Southern side of entrance channel.—Steep Point, the western point of the entrance to Samsa Inlet, is about 4 miles southwestward of Chown Point. The shore between Steep Point and Town Point, about $4\frac{1}{2}$ miles north-northwestward, is rugged. There are numerous inlets along this section nearly filled by mud flats.

Deng (Town) Bay lies immediately southward of Town Point. A village is on the northern side of a stream that flows into the southwestern portion of Deng Bay.

Mount Foster, 1,482 feet high, has a conspicuous sharp summit; it lies about midway between Steep Point and Town Point, and less

than 1 mile inland. Johnston Ranges, a little farther inland, are rugged; many of the summits are inaccessible. The valleys between the ranges are cultivated. Alacrity Range, westward and northward of Johnston Ranges, is high and broken. The highest peak, Mount Underwood, is about 5 miles westward of Town Point, and is 3,000 feet high.

Town Point is the steep-to extremity of a peninsula that rises to an elevation of 1,210 feet in Mount Davy, lying about 2 miles north-westward of Town Point.

Islands and dangers in the entrance channel.—Channel Rock lies about 1,200 yards westward of Castle Point. The rock dries 14 feet, and is marked by an iron **beacon** surmounted by a sphere; the beacon is 12 feet high.

Cone Island is rugged; a summit in about the center of the island attains a height of 577 feet. Hail Point, the western extremity of the island, is about 1 mile northward of Town Point. The island is about $\frac{3}{4}$ mile long in an east and west direction, and over $\frac{1}{2}$ mile wide. Several rocks drying from 2 to 18 feet lie close off the northern shore of the island. Steeple Rocks, 60 feet high, lie about 300 yards off the southeastern extremity of Cone Island. Some rocks drying about 25 feet lie about the same distance south-southeastward of Steeple Rocks.

The channel westward of Cone Island is clear and deep; the points on either side are fairly steep-to. At spring tides the tidal currents may attain rates of 7 knots; there are tide rips and swirls off Hail Point.

Waterwitch Channel.—The channel westward of Cone Island trends northwestward to connect with Waterwitch Channel.

The northeastern side of Waterwitch Channel is formed by the southwestern shore of Ching (Crag) Island. The southwestern extremity of Ching Island lies about $2\frac{1}{2}$ miles northwestward of Hail Point. Ching Island is about 3 miles long in an east and west direction, and is nearly $1\frac{1}{2}$ miles wide. Several peaks on the island have nearly the same elevation; the highest, 1,265 feet high, is in the western part of the island.

The southwestern side of Waterwitch Channel is formed by the coast of the mainland between a point about $2\frac{1}{4}$ miles north-northwestward of Town Point and a point about 3 miles farther northwestward. There are numerous small inlets along this section, all filled by mud flats. Mount Three Crag, a short distance inland near the northwestern end of Waterwitch Channel, has three sharp crags on its 1,390-foot summit.

The southeastern part of Waterwitch Channel is clear of dangers except for Vivien Rock. This rock, over which the depth is $1\frac{1}{2}$

fathoms, lies about 700 yards southeastward of the southwestern extremity of Ching Island.

Waterwitch Channel is at times almost completely blocked by fishing boats and nets. The nets are moored by heavy baskets of stones and the net poles show in groups some feet above water. These should be avoided, as the mooring ropes are very strong.

There are several islets and dangers near the northwestern end of Waterwitch Channel. Foul ground, with irregular depths, extends as far as 600 yards off the southwestern shore of Ching Island. Pillar Rocks, granite boulders as high as 20 feet, lie about $\frac{1}{2}$ mile southward of the northwestern extremity of the island and about 600 yards offshore. A ledge of flat rocks, with the outer extremity awash, extends about 200 yards southwestward from Pillar Rocks. These dangers lie on the eastern side of the fairway through Waterwitch Channel.

On the western side of the fairway through Waterwitch Channel is Diver Islet. This islet is 35 feet high, and lies about $\frac{1}{2}$ mile eastward of the point on the mainland at the northwestern end of the channel. A group of rocks, one 1 foot high, lies about 200 yards northward of Diver Islet.

Waterwitch Channel is narrowest between Diver Islet and the rocky ledge extending southwestward from Pillar Rocks; here the tidal currents are strong, and there are tide rips and swirls. The outgoing current sets towards Diver Islet.

Kaiser Rock lies about 1,100 yards north-northwestward of Diver Islet. This steep-to rock is just awash at lowest low water. A black conical **buoy** marks Kaiser Rock. The tidal eddies around the rock are strong.

PORT OF SANTUAO ($26^{\circ}38' N.$, $119^{\circ}40' E.$, *H. O. Chart 2557*).—Santuaio Anchorage lies between the western part of the southern shore of Santuaio Island and the mainland to the southward; the town of Santuaio is near the southwestern extremity of Santuaio Island.

Depths.—The depths in Santuaio Anchorage are $5\frac{1}{2}$ to 17 fathoms; vessels anchor in depths of 8 to 10 fathoms.

Southern shore of Santuaio Anchorage.—Apex Point is nearly 4 miles westward of Diver Islet. The point is the northwestern extremity of a bluff that rises to an elevation of 878 feet a short distance from the extremity of the point. The bluff forms the western side of Cascade Bay, at the head of which is the entrance to a small river fed by a waterfall 300 feet high. The village of Wanyao lies about $1\frac{3}{4}$ miles southwestward of Apex Point.

Santuaio Island, the largest island within Samsa Inlet, lies with King Point, its southwestern extremity, about $1\frac{1}{4}$ miles north-northwestward of Apex Point. The island is about $5\frac{1}{2}$ miles long in an east and west direction and is about 2 miles wide. Mount Mac-

Allum, 1,476 feet high, is in the northwestern part of the island and is the highest summit. Mount Stevens, 1,205 feet high, lies about $1\frac{1}{2}$ miles east-northeastward of King Point. Hecla Point is the southeastern extremity of Santuao Island. The shoalest part of Santuao Anchorage is a $4\frac{3}{4}$ -fathom patch about 1,400 yards southward of Hecla Point. Mud flats extend as far as $1\frac{1}{4}$ miles from the southeastern shore of Santuao Island; Mud Islet, 30 feet high, lies on the eastern edge of these flats. Customs Point, about 800 yards east-southeastward of King Point, has on it a native customhouse.

Lay Rocks, the principal danger within Santuao Anchorage, form a rugged group drying about 20 feet. A rounded boulder, 3 feet high, lies on the southern edge of the group in a position about 500 yards southeastward of Customs Point. At low water these rocks appear like an island. The depths as far as $\frac{1}{4}$ mile westward and southwestward of Lay Rocks are irregular.

Anchorage.—The best position for anchoring is about $\frac{1}{2}$ mile southeastward of Customs Point, in depths of 8 to 10 fathoms. The recommended position is with King Point bearing 293° and just open northward of Lay Rocks, and with Mount Stevens bearing 43° .

Storm signals.—Storm signals according to the supplementary system (p. 31) are displayed on a flagstaff near the native customhouse on Customs Point.

Submarine cable.—A submarine cable extends across Santuao Anchorage from Customs Point to Apex Point.

Tidal currents.—The tidal currents turn at the times of high and low water. In the entrance channel the currents may attain a rate of 4 to 7 knots, according to the age of the moon. The currents follow the directions of the channels, dividing where there are islands; they run at a greater rate past the salient points of the islands. The main current divides southward of Cone Island, one branch passing through Aurora Channel, and the other following Waterwitch Channel to Santuao Anchorage.

The ingoing tidal current tends to keep vessels in the middle of the channels, but when entering Samsa Inlet with the outgoing current care is necessary when passing Castle Point, Hail Point, and between Diver Islet and Pillar Rocks, as the outgoing current sets strongly onto the starboard bow.

Directions.—Vessels bound for the Port of Santuao should pass about 4 miles southwestward of Spider Island and then steer for the entrance. Channel Rock may be passed on either side; the highest peak on Ching Island bearing 336° , and in range with Hail Point, leads through the middle of the channel between Channel Rock and Castle Point.

Cone Island may be passed on either side; it is reported that Aurora Channel (p. 431) is more convenient for vessels with a large turning

radius. After passing Cone Island a midchannel course through Waterwitch Channel should be steered, passing midway between Diver Islet and the rocky ledge extending southwestward from Pillar Rocks. The southwestern side of Ching Island bearing 305° astern, and in range with the northeastern extremity of Cone Island, leads about 400 yards northeastward of Kaiser Rock.

After passing Kaiser Rock vessels should steer for the anchorage, noting the $4\frac{3}{4}$ -fathom shoal southward of Hecla Point. Vessels anchoring westward of Lay Rocks must pass well southward of the rocks.

The effect of the outgoing tidal current (p. 427) must be kept in mind.

Santuao ($26^\circ 39' N.$, $119^\circ 40' E.$, *H. O. Chart 2557*).—The town lies close northeastward of Customs Point on the western side of an inlet nearly filled by a mud flat. A stone jetty and a pier are located on Customs Point.

Very small quantities of fuel oil and gasoline are available.

Santuao is connected with the general telegraph system. A telephone line runs to Foochow, and there is also communication by steamer with that city.

SAMSA INLET (continued)—**SAMSA BASIN** (*H. O. Chart 2556*).—Samsa Basin, the northeasternmost portion of Samsa Inlet, is an extensive indentation with depths of over 5 fathoms in its center. The channels leading to Samsa Basin are deep; the principal channels are Aurora Channel, Algerine Roads, and Bowring Channel. The basin is entered between Sibbald Island and a point about $1\frac{1}{2}$ miles eastward of the island.

Aurora Channel.—This channel leads off northeastward from the inner end of the Samsa Inlet entrance channel.

The western side of the channel is formed by Cone Island, Nguong Island, and Ching Island. Nguong Island ($26^\circ 36' N.$, $119^\circ 48' E.$, *H. O. Chart 2557*), about 238 feet high in its center, is separated from the eastern part of the southern side of Ching Island by a channel about 700 yards wide; junks anchor in this channel. A rocky islet, 105 feet high, lies on the outer edge of a shoal that extends about $\frac{1}{2}$ mile eastward from Nguong Island.

The eastern side of Aurora Channel is formed by the western side of Tungchung Peninsula southward of Ridge Point. An islet 160 feet high lies close off the eastern shore of the channel in a position abreast Cone Island. A rock 4 feet high lies about $\frac{1}{4}$ mile northward of this islet.

Algerine Roads.—The southeastern side of Algerine Roads is formed by the northwestern shore of Tungchung Peninsula between Ridge Point and Plover Point, about 4 miles northeastward. This shore is slightly indented. Wooded spurs from the De La Garde Range, which rises a short distance inland, descend steeply to the shore. Mount Black, 1,077 feet high, is a summit of the range about midway between Ridge Point and Plover Point. Four islets lie on a mud flat extending about 400 yards from the shore abreast Mount

Black. A rock, with a depth of $1\frac{1}{4}$ fathoms over it, lies about 500 yards northwestward of the northeasternmost islet. An islet, 20 feet high and brownish, lies about 300 yards northwestward of Plover Point. A rocky reef extends about 250 yards northeastward from this islet. A rock 6 feet high lies about 150 yards northeastward of Plover Point.

The northwestern side of Algerine Roads is formed by a section of the northern shore of Samsa Inlet extending about $2\frac{1}{4}$ miles northeastward from Foul Point. This point is about $2\frac{1}{4}$ miles northwestward of Plover Point. The Slade Range runs northward from Foul Point. Foul ground extends nearly 800 yards southward from an islet close off the point. Another islet, with a rock 14 feet high off its western side, lies about $\frac{1}{2}$ mile east-northeastward of Foul Point.

Anchorage in Algerine Roads.—The best location in Samsa Inlet to ride out a typhoon is in Algerine Roads. There is good anchorage westward of Plover Point.

Bowring Channel.—A channel past either side of Low Islet connects Bowring Channel with Algerine Roads.

Low Islet lies about $1\frac{1}{2}$ miles northeastward of Plover Point. The islet is slightly more than $\frac{1}{2}$ mile long in an east and west direction and is about 800 yards wide. Drying shoals extend about 600 yards southwestward and about 300 yards northeastward from the islet. A rock, 40 feet high, lies about 1 mile west-southwestward of the northwestern extremity of Low Islet.

The channel northwestward and northward of Low Islet is safe; this is also true of the channel between Low Islet and the Blackburn Islets to the southeastward.

An islet, nearly connected to the mainland, lies with its southwestern extremity, Spike Hill, about $3\frac{1}{4}$ miles east-northeastward of Plover Point. Spike Hill is 236 feet high. Several islets rise from a broad mud flat that extends from the shore between Plover Point and Spike Hill; this mud flat has a well-defined outer edge.

The four Blackburn Islets lie within a distance of $\frac{1}{2}$ mile off the outer edge of this flat. The southwesternmost and largest islet, 78 feet high, is about $1\frac{1}{4}$ miles east-northeastward of Plover Point; the northeasternmost islet, 55 feet high, is about $\frac{3}{4}$ mile west-southwestward of Spike Hill.

Sibbald Island, on the northwestern side of Bowring Channel, lies with its southeastern extremity about $1\frac{1}{4}$ miles northwestward of Spike Hill. An islet lies close off the eastern side of Sibbald Island; a flat extends about 1 mile south-southwestward from this islet. A rock 7 feet high lies about $\frac{3}{4}$ mile eastward of the southeastern extremity of the island. This rock lies in the fairway and care must be taken to avoid it. The eastern extremity of Sibbald Island is the western point of the entrance to Samsa Basin.

Mount Alton, 1,138 feet high and conspicuous, is on the eastern side of Bowring Channel near the entrance to Samsa Basin.

Samsa Basin.—Mud flats and shoal water extend for a considerable distance off the shores of Samsa Basin. There are depths of over 5 fathoms in the central part for about 3 miles within the entrance.

NORTHERN PART OF SAMSA INLET (*H. O. Chart 2556*).—The northern part of Samsa Inlet consists of several extensive bights between tongues of land on which rise ranges of hills.

A channel trends toward the head of each bight; except for these channels the bights are filled by drying mud flats. The principal channels are Trinity Channel, Weigall Channel, and Somerville Channel.

Northern shore of Samsa Inlet.—Between Foul Point and Jonas Point, about 4 miles northwestward, the northern shore of Samsa Inlet forms a bight. Mud flats extend from the shores and completely fill Werner Bay, which lies at the head of the bight. The village of Kouang lies at the head of Werner Bay.

Grand Range, on the northern side of Werner Bay, has an imposing appearance; Mount Pudsey Dawson, the highest part, has three distinct summits, each about 2,500 feet high. About $3\frac{1}{2}$ miles northeastward of the head of Werner Bay this range unites with Slade Range; the ranges enclose a deep, cultivated valley.

Thames Point is about $4\frac{1}{4}$ miles northwestward of Jonas Point. Thames Point is the extremity of Pinnacle Range. This range has a number of sharp peaks; Mount Star, about $\frac{3}{4}$ mile northward of Thames Point and 1,870 feet high, is the highest summit.

Tay Point and Ford Point are the outer extremities of Crescent Range, which lies westward of Pinnacle Range. The southern side of Crescent Range is rocky and precipitous. Tay Point is less than $\frac{3}{4}$ mile southwestward of Thames Point; Ford Point is about $1\frac{1}{4}$ miles southward of Tay Point. A bank with general depths of less than 3 fathoms extends about $\frac{3}{4}$ mile southward and nearly $1\frac{1}{2}$ miles eastward from Ford Point.

Islands in the northern part of Samsa Inlet.—Machui Island lies southward of Jonas Point; the intervening channel is about 300 yards wide. Near the northwestern end of the island is a conical hill 682 feet high. A small islet, 24 feet high, lies close off the eastern extremity of Machui Island; a mud flat extends about 600 yards southward from this islet.

Babu Island lies northwestward of Machui Island; the intervening channel is about 400 yards wide, and is deep. A bank, with depths less than 3 fathoms, extends nearly 1 mile northward from the island; the channel between the eastern side of this bank and the flats extending from the coast to the eastward is deep.

A summit near the northeastern extremity of Santuao Island (for principal description see p. 429) is 926 feet high. The channel between the eastern end of the island and Babu Island to the northeastward is deep. Santuao Bank, with depths of less than 3 fathoms, extends from the northern shore of Santuao Island. At the western end of the island the outer edge of the bank is about $3\frac{1}{2}$ miles to the northward; the outer edge then recedes to the southeastward, so that at the eastern end of the island the edge of the bank is only 800 yards distant.

Elbow Islet, 40 feet high, lies at the eastern end of Santuao Bank in a position about $1\frac{1}{2}$ miles south-southeastward of Ford Point.

Peak Islet, 60 feet high, lies about 400 yards off the middle of the northern shore of Santuao Island.

Trinity Channel.—Trinity Channel trends northward through the bight eastward of Pinnacle Range. Tree Islet, 75 feet high, lies about 3 miles northeastward of Thames Point; Trinity Channel bifurcates at Tree Islet. The eastern branch is narrow, and shoals gradually to lose its identity in the mud flats in the northeastern portion of the bight. The western branch narrows in a position about $2\frac{1}{4}$ miles above Tree Islet; it is almost blocked by mud banks, but there is, nevertheless, a channel, with depths of 6 to 9 feet, nearly to the village of Siengdieng, about $8\frac{1}{2}$ miles above Tree Islet.

Weigall Channel.—This channel lies between Pinnacle Range and Crescent Range. At the head of the channel is the entrance to the Fuan River; the town of Fuan lies about 25 miles from the entrance. Weigall Channel is deep except in a short section off a point about 1 mile northwestward of Thames Point; here the fairway narrows, and the depths decrease to about 4 fathoms.

Somerville Channel.—This channel lies southwestward of Crescent Range. It is entered between the shoal extending southward from Ford Point and Santuao Bank. The channel approaches the shore closely abreast Esk Point, about $1\frac{1}{2}$ miles westward of Ford Point. It runs close to the shore as far as Bold Point, $2\frac{1}{2}$ miles northwestward of Esk Point. The channel then turns to follow the northern shore of Grieve Island; it ends in a bay that has been only partially examined. The entrance to this bay is almost blocked by Paishih Island.

WESTERN PART OF SAMSA INLET (*H. O. Chart 2556*).—Samsa Inlet westward of Santuao Island is nearly filled by a drying flat; several channels, none of them deep, trend through this flat. Two channels, Pagoda Creek and Ningteh Channel, lead to the town of Ningteh, the largest town within Samsa Inlet.

There are numerous islands in the western part of Samsa Inlet. Spider Island is the largest, and on it are two towns, Parquan and Tungwan.

Channels leading to Ningteh.—Pagoda Creek, the southern channel, trends westward and northwestward from Santuao Anchorage to the town of Ningteh. This channel is only navigable by boats 1 hour after low water. Feloon Creek branches off southwestward from Pagoda Creek and leads to the town of Feloon.

Ningteh Channel, the northern channel from Santuao Anchorage to the town of Ningteh, is wider than Pagoda Creek, and is deeper except in the western part. The junks that use this channel always ground off Ningteh.

Islands.—Olive Island, 174 feet high, lies about 1,300 yards westward of King Point, the southwestern extremity of Santuao Island. Olive Island marks the southeastern extremity of Sheldrake Flats, which extend eastward from Spider Island and Grieve Island. Sampan Islet, 40 feet high, lies about 1 mile northward of King Point on the edge of the mud flat extending from the western shore of Santuao Island.

Spider Island lies on the northern side of Ningteh Channel. A hill in the northern part of the island is 851 feet high. The island is intensively cultivated.

A narrow channel, Causeway Creek, separates Spider Island from Grieve Island to the northward. A sharp peak in the southwestern part of Grieve Island is 1,040 feet high.

Pagoda Island, 342 feet high, is connected to the mainland close southeastward of the town of Ningteh by a causeway. A pagoda on the summit of the island is 60 feet high.

COAST FROM SAMSA INLET TO THE MIN RIVER (*B. A. Chart 1761*).—From Steep Point, the western point of the entrance to Samsa Inlet, the coast trends irregularly southeastward to Ragged Point, the extremity of a long, narrow peninsula. Loyuan Bay is an extensive indentation along this section.

The coast trends southwestward about 20 miles from Ragged Point to the northern point of the entrance to the Min River. There are a number of bays along this section; a large bay lies on either side of Tungshan Peninsula, which lies about 10 miles southwestward of Ragged Point.

Coast.—Mouth Point ($26^{\circ}27' N.$, $119^{\circ}50' E.$, *H. O. Chart 2556*), about $2\frac{1}{4}$ miles south-southeastward of Steep Point, is the northern point of the entrance to Loyuan Bay. South Point, the southern point of the entrance to this bay, lies about $1\frac{1}{4}$ miles south-southeastward of Mouth Point.

Black Peak, which lies near South Point, is about 1,000 feet high.

LOYUAN BAY indents the coast between Mouth Point and South Point in a southwesterly direction. The bay is deep. Its steep shores are about 1 mile apart for a distance of nearly 5 miles; the bay then opens into a basin that is shoal except for a channel trending in a

northwesterly direction and another channel trending in a southerly direction.

Shores.—Cromlech Head, a prominent headland off which are tide rips, is on the southern shore of Loyuan Bay in a position about 1½ miles westward of South Point. The headland is steep-to.

Achin Head is also on the southern shore of the bay; it lies about 4¼ miles southwestward of Cromlech Head. Achin Head is beyond the deep portion of Loyuan Bay; a bank with depths less than 3 fathoms extends as far as ½ mile off the head. The channel trending southward from the head of Loyuan Bay passes close westward of Achin Head.

The northern shore of Loyuan Bay is irregular. A large bay, entered westward of a point about 1¼ miles southwestward of Mouth Point, is nearly filled by a drying flat.

Mount Carey, 1,210 feet high, lies about 1 mile within the northern shore of the bay in a position about 2¾ miles west-southwestward of Mouth Point.

Islets and dangers in Loyuan Bay.—Halftide Rocks lie within 300 yards of a point on the northern shore about 1 mile southwestward of Mouth Point.

Twin Islets lie in midchannel in a position about 1 mile southwestward of Cromlech Head; the islets are nearly connected with each other.

Snake Islet lies close off the southern shore about 1¾ miles southwestward of Cromlech Head.

Green Islet is close offshore in a position about midway between Snake Islet and Achin Head.

Fushow Channel.—The northwestern arm of Loyuan Bay is entered through this channel, which lies between Sunset Island and the mainland to the northeastward. Sunset Island, 150 feet high, is about 1¼ miles northwestward of Green Islet. Friday Island lies on the southwestern side of Fushow Channel in a position about ½ mile northwestward of Sunset Island. A rock with a depth of 5 fathoms over it lies northeastward of Sunset Island nearly in the middle of Fushow Channel.

Anchorage in Loyuan Bay.—Loyuan Bay is a convenient typhoon refuge.

Vessels can anchor in depths of 7 to 8 fathoms about 1,200 yards southward of Sunset Island.

There is also anchorage in the northwestern arm of the bay, in depths of 6 to 10 fathoms; the recommended position is about ½ mile north-northeastward of Friday Island.

Small vessels can anchor off the northeastern shore of this arm as far as 6 miles northwestward of Friday Island in depths of not less than 4 fathoms.

THE COAST trends irregularly southeastward for about 6 miles from South Point and then northeastward for about 4 miles to Ragged Point.

Off-lying islands and dangers.—Ragged Point ($26^{\circ}23' N.$, $119^{\circ}57' E.$, *H. O. Chart 2556*) is the extremity of a long narrow peninsula; as far as ½ mile northward and northwestward of the point there are numerous rocks, some above water.

The easternmost of the three Rag Islands lies about 3 miles northwestward of Ragged Point. The other two islands lie within a distance of 1½ miles westward of this island. A rock, with a depth of 5 fathoms over it, lies about ½ mile westward of the westernmost Rag Island. The 336° range for clearing Channel Rock in the entrance to Samsa Inlet (p. 430) leads over this rock.

Bittern Rock dries; it lies about ¾ mile northward of a small islet close off the northern extremity of the easternmost Rag Island.

Diplo Islet lies about ½ mile southeastward of Ragged Point. A reef extends nearly 200 yards southeastward from the southeastern shore of Diplo Islet. Small vessels with local knowledge sometimes proceed through the channel between Diplo Islet and Ragged Point. During the northeast monsoon there is generally a heavy tide rip and a heavy sea off Diplo Islet.

Fishing stakes may be encountered extending northeastward from the easternmost Rag Island. The tidal currents among the Rag Islands and off Ragged Point are rapid; at times they attain a rate of 3 knots.

Anchorage can be obtained by vessels with local knowledge westward of the westernmost Rag Island; the depths appear to be irregular. Small vessels frequently anchor under the lee of the small islet close northwestward of Ragged Point.

Coast and off-lying islands.—From Ragged Point the coast trends about 5¼ miles southwestward to the eastern point of the entrance to Wanki Bay. The entrance to this bay is less than ½ mile wide. A **light** (see Light List) is occasionally exhibited from a white beacon located on a point about 1 mile eastward of the eastern point of the entrance of Wanki Bay. Claret Rocks lie southward of this point. The group consists of rocks 20 to 30 feet high, and several rocks below water; the outermost rock is about 1¾ miles southward of the eastern point of the entrance to Wanki Bay. A rock awash lies about ¼ mile westward of this point.

Small vessels with local knowledge secure good shelter in Wanki Bay. The bay is frequented by junks.

A point about 1 mile southwestward of the western point of the entrance to Wanki Bay is the eastern point of the entrance to a large bay. The eastern side of Tungshan Peninsula forms the western side of this bay. Mount Tung on Tungshan Peninsula is 726 feet

high. Flat Islet, 58 feet high, and Crab Islet, 93 feet high, and numerous other islets and rocks lie southward and south-southeastward of the extremity of Tungshan Peninsula. Square Rocks, the outermost rocks, lie within a distance of 3 miles of this extremity. Mushu Islet, 195 feet high, lies about $4\frac{1}{2}$ miles southwestward of this extremity.

Tinghai Bay, on the western side of Tungshan Peninsula, is shoal. The western point of the entrance to the bay is about $4\frac{1}{2}$ miles westward of the southern extremity of Tungshan Peninsula. Small vessels anchor in Tinghai Bay during the northeast monsoon. During the flood tide there is a strong in-draft into the bay.

The northern point of the entrance to the Min River is about 9 miles southwestward of the extremity of Tungshan Peninsula. The coast between the western point of the entrance to Tinghai Bay and the Min River northern entrance point is indented by a bay. Au to, an islet 131 feet high, is 2 miles north-northeastward of the latter point.

OUTLYING ISLANDS AND DANGERS (*B. A. Chart 1761*).—

There are numerous outlying islands off the coast between Samsa Inlet and the Min River.

Tungyung ($26^{\circ}22' N.$, $120^{\circ}30' E.$, *B. A. Chart 1761*) lies about 29 miles eastward of Ragged Point. The island is about 500 feet high, and has steep shores. **Tungyung Light** (see Light List) is shown from a white circular tower, 46 feet high, on the eastern slope of the island. Two white buildings are situated just above the lighthouse. A fog signal is occasionally made with a gun. Rocky ledges extend about $\frac{1}{4}$ mile from the southwestern side of Tungyung.

An island lies close northwestward of Tungyung, and appears as part of the latter island except on northeasterly or southwesterly bearings. A rock lies in the fairway through the narrow intervening channel. A reef extends about $\frac{1}{2}$ mile northward from the northern side of the island northwestward of Tungyung. Bertha Cove indents the southern side of the latter island.

Anchorage.—During the northeast monsoon there is good anchorage, with smooth water, in Bertha Cove for vessels with local knowledge. The depths are 4 to 6 fathoms.

In 1931 a British naval vessel anchored off Bertha Cove, in a depth of 10 fathoms, and found good shelter and good holding ground. This vessel approached the anchorage on a course of 0° ; no fishing stakes were encountered on this course. A vessel approaching Bertha Cove after dark would probably foul the propeller by running over bamboo ropes connecting floating stakes to fish traps.

Tungsha (Alligator Islet) lies about 14 miles south-southwestward of Tungyung. Tungsha is a barren rock about 40 feet high.

Larne Islet, 356 feet high, lies about 14 miles westward of Tungyung. There are numerous large boulders on the islet. A ledge extends about $\frac{1}{2}$ mile southwestward from the islet. A rock awash lies close off its northern extremity; a rock, 9 feet high, lies about 400 yards eastward of the same extremity. Bamboo ropes, similar to those encumbering Bertha Cove, are to be found in the vicinity of Larne Islet.

Larne Rock lies about $5\frac{1}{2}$ miles southward of Larne Islet. The rock is low and flat. A reef extends about 400 yards northward from it.

A reef awash lies about 5 miles north-northwestward of Larne Islet. It is reported that no indication of shoal water was seen on several occasions when passing near this reef.

Pai sha (Gordon Islet), 560 feet high near its southern extremity, lies about 13 miles west-southwestward of Larne Islet, and about 6 miles south-southeastward of Ragged Point. Foul ground extends nearly 1 mile eastward from Pai sha. An islet lies close off the western extremity of Pai sha; about $\frac{1}{2}$ mile west-northwestward of this extremity is Gordon Rock, which dries 7 feet. A rock, 10 feet high, lies 300 yards west-northwestward of the northern extremity of Pai sha; the intervening channel is foul. About $1\frac{1}{4}$ miles northeastward of the same extremity is a black rock 25 feet high.

Ching au, an island 295 feet high, lies south-southwestward of Pai sha. The intervening channel is about $1\frac{1}{2}$ miles wide and is encumbered by rocks; a rock drying 18 feet lies close off the northwestern extremity of Ching au; a group of rocks, of which the northernmost and highest is 72 feet high, lies nearly $\frac{1}{2}$ mile north-northwestward of the same extremity. A rock with a depth of $1\frac{1}{2}$ fathoms over it, was reported (1906) to lie about $\frac{1}{4}$ mile north-northeastward of the 72-foot rock. Kiao tse, an islet 260 feet high, is nearly connected to the northeastern extremity of Ching au.

Tang ki (Pei kan tang) lies with its northern extremity about 250 yards southward of the southern extremity of Ching au. This channel is obstructed by a reef, with a depth of $3\frac{1}{4}$ fathoms, extending nearly 200 yards southward from Ching au. The island is over 3 miles long in a northeast and southwest direction, and is less than 1 mile wide. The southeastern portion of the island is connected to the remainder by a sandy isthmus. Tang ki is hilly; a conspicuous summit, the higher of two, is less than 1 mile from the northeastern extremity, and is 947 feet high. Tang ki is intensively cultivated; there are several villages on the island. Tang ki tau is an islet close off the southeastern extremity of Tang ki; a summit on Tang ki tau is 184 feet high. Kin lai, an islet 190 feet high, lies close off the southern extremity of Tang ki.

Magpie Bay, on the southern side of the sandy isthmus of Tang ki, affords good shelter from northeasterly winds. The depth in a position with the summit of Tang ki tau bearing 126° , and $\frac{1}{2}$ mile distant, is $4\frac{1}{2}$ fathoms.

Bluff Head is the eastern extremity of an islet lying about 500 yards off the northeastern extremity of Tang ki; Bluff Head is 216 feet high.

Chung she (Pastel Rock), 102 feet high, is a small islet lying about 1 mile westward of the southern extremity of Tang ki.

The southwesternmost of the Trio Rocks lies about $1\frac{1}{4}$ miles southward of Bluff Head; this rock is 46 feet high. The northeasternmost and largest rock, 101 feet high, lies nearly $2\frac{1}{2}$ miles eastward of Bluff Head; this rock is split into two parts. Close southeastward of this rock is a rock drying 17 feet. The other Trio Rock, 78 feet high, lies about $\frac{1}{4}$ mile southward of the highest rock.

The channel between the Trio Rocks and Tang ki is safe.

Matsu Island lies with its eastern extremity $1\frac{1}{2}$ miles southward of the southern extremity of Tang ki. The island is nearly 3 miles long in an east and west direction, and is over $2\frac{1}{4}$ miles wide across its western part. The island is hilly and cultivated; it is well-populated.

Pirie Bay indents the northern side of Matsu Island. Here there is shelter from winds between east and west-northwest through south. The depths farther than 600 yards off the shores of the bay are 5 fathoms, but anchorage is not recommended because of the rocky bottom. A $4\frac{1}{4}$ -fathom patch lies about 1,200 yards east-northeastward of Hamelin Point, the northwestern extremity of Matsu Island. Wu an (Reef Islet), 191 feet high, is the largest of several islets and rocks lying close off the northeastern extremity of Matsu Island.

Bayard Point is the southwestern extremity of Matsu Island; the point is 95 feet high. Matsu Road is off the western shore of the island.

Anchorage.—Vessels drawing not more than 18 feet can secure good anchorage in Matsu Road, with shelter from the prevailing northeast wind, and also from the swell. The holding ground is good. The recommended position is about 600 yards offshore, with Bayard Point bearing about 175° and in range with the western end of Tung Sha (p. 442) and with a gap in the hills of Matsu Island bearing 72° . There are fishing stakes in the vicinity of the anchorage.

The anchorage in Matsu Road is frequently used by vessels waiting to enter the Min River.

Matsu Strait.—This strait, between Matsu Island and Tang ki, has a navigable width of nearly 1 mile between reefs on either side. Pirie Rock, a pinnacle rock over which the depth is $3\frac{1}{2}$ fathoms, lies in the fairway in a position about $\frac{3}{4}$ mile north-northwestward of Wu an. Swallow Rock lies on the northern side of the fairway in a posi-

tion about $1\frac{1}{4}$ miles north-northeastward of Wu an; the depth over Swallow Rock is 3 feet. Magpie Rock, about 400 yards northwestward of Swallow Rock, is 35 feet high. A $3\frac{1}{2}$ -fathom patch lies in the channel between Magpie Rock and Kin lai.

APPROACHES TO THE MIN RIVER (*B. A. Chart 1761*).—The entrance to the Min River can be approached from the northward by proceeding between Ragged Point and Pai sha, and thence westward of Tang ki and Matsu Island. These islands, and the coast off which they lie, have been described in the preceding sections.

The approach to the entrance from the eastward trends between Matsu Island to the northward and the Pai Kuen Islands to the southward.

The entrance can be approached from the southward by proceeding between the mainland to the westward, and the Pai Kuen Islands to the eastward.

The water for many miles outside the entrance to the Min River is muddy and discolored; sunken rocks or shoals are not visible unless marked by breakers.

THE PAI KUEN (WHITE DOGS) ISLANDS, on the southern side of the approach to the Min River from the eastward, consist of three islands and numerous islets and rocks.

Tung Kuen ($25^\circ 58' N.$, $119^\circ 58' E.$, *B. A. Chart 1761*) is the largest of the Pai Kuen Islands. Tung Kuen is rocky and precipitous; a summit in the southwestern portion of the island is 384 feet high. **Tung Kuen Light** (see Light List) is shown from a white circular tower, 64 feet high, near the northeastern extremity of the island. A **fog signal** is occasionally made with a gun.

Ta yu, about 1,400 yards north-northeastward of the northeastern extremity of Tung Kuen, is a small islet, 87 feet high, with a remarkable thumb on its northern side. Rocks above water and below water extend about 300 yards southward from Ta yu. A reef drying 13 feet lies about midway between the islet and the northeastern extremity of Tung Kuen.

Shiaoyu, about 1 mile northeastward of the northeastern extremity of Tung Kuen, is a rock 3 feet high. A small rock drying 11 feet lies close south-southwestward of Shiaoyu.

Yung liu, an islet 134 feet high, rises from a reef extending about $\frac{1}{2}$ mile northward from Tung Kuen.

Si niu au is a rock, 49 feet high, about 800 yards westward of Yung liu; a rock, 25 feet high, lies about 200 yards southwestward of Si niu au. These rocks are surrounded by reef to a distance of about 400 yards; a spit, with depths of $2\frac{1}{4}$ to 5 fathoms over it, extends about 1 mile south-southwestward from this reef.

Ling tau, the southernmost of the Pak Kuen Islands, is 211 feet high. It lies about 200 yards southward of Tung Kuen; the intervening channel is shoal. Ling tau is rocky and precipitous.

Tung Sha, the other Pai Kuen Island, lies about $1\frac{1}{2}$ miles northward of Tung Kuen. On the summit of the island, 594 feet high, is a boulder; the latter is the middle hummock of three rounded hummocks. The southwestern slopes of the ridge are strewn with white sand, and show white in misty weather when the remainder of the island is nearly obscured. Breakwater Rock, 53 feet high, lies on the outer extremity of a rocky ridge extending about $\frac{1}{2}$ mile southwestward from the northwestern extremity of Tung Sha. Another rock on this ridge is 33 feet high; both rocks are conspicuous. The wreck of a vessel, visible above water, lies sunk on Breakwater Rock. A sandy spit, with depths of less than 5 fathoms, extends about 1 mile southwestward from the southwestern side of Tung Sha.

Underwood Banks, with a least depth of 4 fathoms, lie within a distance of 3 miles southwestward of Tung Sha.

Anchorage.—Tung Sha Road lies off the southwestern side of Tung Sha. Vessels can anchor in Tung Sha Road; the anchorage is particularly convenient for vessels from the southward waiting to cross the Min River bar. The recommended position is with the summit of Matsu Island bearing 0° and in range with the 33-foot rock near Breakwater Rock, and with the summit of Yung liu bearing about 80° and in range with the southern extremity of Tung Sha. Here the depth is $3\frac{3}{4}$ fathoms, and the bottom is sand.

Islets and dangers between the Pai Kuen Islands and Matsu Island.—Hebe Rock ($26^\circ 04' N.$, $119^\circ 57' E.$, *B. A. Chart 1761*), a pinnacle rock with a depth of $1\frac{3}{4}$ fathoms over it, lies about midway between the Pai Kuen Islands and Matsu Island. Another pinnacle rock, with a depth of 3 fathoms over it, lies about 200 yards north-northeastward of Hebe Rock. A third pinnacle rock, over which the depth is $4\frac{1}{2}$ fathoms, lies about 300 yards east-northeastward of Hebe Rock. The sea rarely breaks on Hebe Rock, nor is there any swirl or disturbance of the water to indicate foul ground.

Sea Dog Islet, 164 feet high, lies nearly $1\frac{1}{2}$ miles north-northeastward of Hebe Rock. Sea Dog Islet is a black precipitous rock. A small rock, 33 feet high, lies close eastward of Sea Dog Islet; foul ground extends nearly 600 yards northward and northwestward from the islet. Pup Islet, a rock 22 feet high, lies about 800 yards north-northeastward of Sea Dog Islet.

Sea Cat Islet, a conspicuous black rock 20 feet high, lies about $1\frac{3}{4}$ miles north-northeastward of Sea Dog Islet. A rock 150 yards westward of Sea Cat Islet dries 13 feet. A $3\frac{1}{4}$ -fathom patch lies about 200 yards southwestward of Sea Cat Islet.

Pilot Rock, a pinnacle with a depth of 1 foot over it, lies nearly 3 miles eastward of Sea Cat Islet; the sea seldom breaks on this rock except at low water.

Norman Court Rocks, a group of rocky heads with depths of 5 feet to 3 fathoms, lie nearly $1\frac{1}{2}$ miles northward of Sea Cat Islet. Norman Court Rocks lie within a distance of $1\frac{1}{4}$ miles of the southeastern shore of Matsu Island. Flat Rock, in the intervening channel, is 10 feet high; the ground close around Flat Rock is foul.

THE COAST forming the western side of the southern approach to the Min River entrance consists of a sandy beach between Sand Peak Point and Niu to, a point about 7 miles southward. Sand Peak Point is the southern point of the entrance to the Min River.

Coast—Off-lying islets.—Niu to ($25^\circ 55' N.$, $119^\circ 41' E.$, *B. A. Chart 1761*) is a prominent point, 97 feet high.

McCauley Rock, about $1\frac{1}{4}$ miles northeastward of Niu to, dries 3 feet. A reef drying 18 feet lies about $\frac{1}{2}$ mile westward of McCauley Rock. A rock drying 7 feet lies about $3\frac{1}{4}$ miles north-northeastward of Niu to, and about 1 mile offshore.

Black Head is a promontory, 84 feet high, lying about 6 miles north-northeastward of Niu to. Pu chau, a rock 15 feet high, lies about $\frac{1}{2}$ mile offshore in a position about $1\frac{1}{4}$ miles southward of Black Head.

Chu shan, an islet 84 feet high, lies just off the mainland abreast Pu chau. Chu Chiang, an islet 70 feet high, lies on the drying coastal bank about midway between Black Head and Sand Peak Point.

Sand Peak, about $1\frac{1}{2}$ miles southwestward of Sand Peak Point, has a sharply defined summit 642 feet high. The sand on the eastern slopes of the hill often shows brightly through the mist when little else is visible. Sand Peak Point is 74 feet high.

Ho shung shan, a peak, 2,042 feet high, of the Serrated Range, lies about $7\frac{1}{2}$ miles westward of Sand Peak Point and is conspicuous.

THE MIN RIVER (*B. A. Chart 1761*) flows generally southeastward to enter the sea through a wide estuary that is nearly filled with three large islands and several islets. The large city of Foochow is within the northern bank of the river about 33 miles from the entrance. Between Foochow and the Min River entrance are two harbors, Pagoda Anchorage and Nantai Harbor.

ISLANDS AND DANGERS IN THE MIN RIVER ENTRANCE.—Wufu Island, nearly 6 miles long in an east and west direction and about 4 miles wide, is the largest of the islands in the estuary of the Min River. Square Peak, 904 feet high, is the summit of the island, and is conspicuous.

Woga Island lies northward of Wufu Island. The island is about 4 miles long in an east and west direction, and is nearly $2\frac{1}{2}$ miles

wide. Saddle Hill, consisting of a summit 745 feet high and a summit 778 feet high, is in about the center of Woga Island. High Sharp Peak, 1,357 feet high, is on the mainland less than 1 mile north-northwestward of the northwestern extremity of Woga Island.

Sharp Peak Island lies northeastward of Wufu Island, and south-eastward of Woga Island. Sharp Peak Island is about 2 miles long in a north and south direction and is about 1 mile wide. Sharp Peak, less than 1 mile within the southern extremity of the island, is 600 feet high.

Cable stations.—Two submarine cables land on the eastern side of Sharp Peak Island. One cable extends to Taiwan (Formosa).

Off-lying dangers.—Outer Min Reef ($26^{\circ}05' N.$, $119^{\circ}50' E.$, *B. A. Chart 1761*) lies about $7\frac{3}{4}$ miles northeastward of Sand Peak Point, the southern point of the entrance to the Min River, and consists of a shoal from which rise several drying rocks. Two of these are sharp pinnacles which dry 13 feet. A red and white checkered whistle buoy, with "Min" in white letters on the sides, is moored about $\frac{1}{2}$ mile east-northeastward of the northeastern pinnacle. High Sharp Peak bearing 292° , and just open northward of the northern side of Sharp Peak Island, leads northward of Outer Min Reef and over the position of the buoy. Two flat rocks lie 200 and 400 yards, respectively, southward of the northeastern pinnacle. The northern flat rock dries 8 feet, and the other dries 6 feet; foul ground extends about 200 yards southeastward from the latter rock.

Bisbee Rock lies about 600 yards northward of the southwestern pinnacle rock of the Outer Min group. Bisbee Rock is a pinnacle rock with a depth of 2 fathoms over it. Foul ground extends about 200 yards northward from Bisbee Rock.

Aymar Rock lies about $4\frac{3}{4}$ miles northward of Outer Min Reef. Aymar Rock is a pinnacle with a depth of 3 feet. A red and black checkered buoy, with "Aymar" in white letters on its sides, and surmounted by a diamond, is moored about 550 yards east-southeastward of Aymar Rock.

Rees Rock, about $5\frac{1}{2}$ miles westward of Outer Min Reef, is a black pinnacle drying 19 feet.

Europe Rocks lie about $2\frac{3}{4}$ miles northeastward of Sharp Peak Island. They consist of two heads, about 500 yards apart, with depths of 4 feet over them. A privately maintained black bouy marks Europe Rocks.

Entrance bars.—The outer bar in the Min River entrance extends as far as 8 miles eastward of the southeastern extremity of Wufu Island, and consists of hard sand that dries in places. In 1935 the least depth on the outer bar, across the main entrance channel, was 14 feet. As a rule the local pilots do not take into the river a vessel drawing more than $24\frac{1}{2}$ feet; however, at spring tides during the

northeast monsoon vessels with a draft of $26\frac{1}{2}$ feet can reach Pagoda Anchorage.

The inner bar is southward of Sharp Peak Island. In 1935 the least depth on this bar was $10\frac{1}{2}$ feet.

Entrance channel.—Buoyage.—There are several channels between the islands and islets in the estuary of the Min River. The channel in general use, and the only one buoyed, trends along the southern river side of Sharp Peak Island and along the southern side of Woga Island. Woga Channel, between Woga Island and Sharp Peak Island, is narrow and intricate and is not used by ocean-going vessels; it is, however, much used by junks, which proceed through it in fleets conducted by a single pilot.

Entrance Buoy, a red buoy surmounted by a black sphere, is moored on the northern side of the entrance to the principal channel in a position about $2\frac{1}{4}$ miles northwestward of Outer Min Reef.

Central Buoy, a red buoy surmounted by a black inverted frustum, is also on the northern side of the channel in a position about $2\frac{3}{4}$ miles westward of Entrance Buoy.

Inner Buoy, a red buoy surmounted by a black sphere, is on the northern side of the channel about $2\frac{1}{2}$ miles westward of Central Buoy. The inner bar is close westward of this buoy.

A red buoy is moored on the northern side of the channel in a position about $\frac{3}{4}$ mile southward of Sharp Peak on Sharp Peak Island. This buoy is a mark for Eme Rock, a pinnacle over which the depth is 6 feet; the buoy is normally close southeastward of the rock.

Tides.—The mean high water interval in the entrance to the Min River is 10h. 10m.; the mean range is 15.0 feet, and the spring range is 19.6 feet.

Tidal currents.—The west-going tidal current sets toward Sharp Peak Island; this current runs from $4\frac{1}{2}$ hours before high water until $1\frac{1}{2}$ hours after high water. The east-going current runs from $1\frac{1}{2}$ hours after high water until $4\frac{1}{2}$ hours before the next high water. During freshets the latter current begins earlier and runs for a much longer period. During heavy freshets vessels do not swing to the west-going current.

During the rainy season in April, May, and June the west-going current runs for a shorter period, and the east-going current is correspondingly longer.

Outer anchorage.—Vessels can anchor between the outer bar and the inner bar in a pool with depths of $3\frac{3}{4}$ to 5 fathoms. It is reported, however, that vessels in this anchorage are not well sheltered.

THE MIN RIVER FROM SHARP PEAK ISLAND TO PAGODA ANCHORAGE (*B. A. Chart 1761*).—The principal channel to Pagoda Anchorage trends west-northwestward between Sharp Peak Island and Woga Island on the north and Wufu Island on the south. A

short distance within Kinpai Pass the channel trends southwestward for about 11 miles to Pagoda Anchorage.

East Brother Islet ($26^{\circ}07' N.$, $119^{\circ}38' E.$, *B. A. Chart 1761*) is on the southern side of the fairway about $1\frac{1}{2}$ miles west-northwestward of the southern extremity of Sharp Peak Island. West Brother Islet, 61 feet high, is on the same side of the fairway, close northward of East Brother Islet. A bank, parts of which are above water, extends over 1 mile westward from West Brother Islet; Wild Duck Rock, drying 5 feet, is close northward of the western part of this bank. A stone barrier extends about 300 yards northwestward from Wild Duck Rock; the outer extremity of the barrier is marked by a black conical buoy.

Zephyr Rock is on the northern side of the channel in a position about 200 yards off Woga Point, the southern extremity of Woga Island. Zephyr Rock is a pinnacle with a depth of 3 feet over it. Woga Point is abreast West Brother Islet. The depths in this vicinity are very irregular; there is a heavy overfall during the strength of the tidal current. Temple Rock is also on the northern side of the fairway; the depth over Temple Rock is $1\frac{3}{4}$ fathoms, and it lies about $\frac{3}{4}$ mile west-northwestward of Woga Point. The rock is marked by a red buoy; the fairway between this buoy and the black buoy marking the outer extremity of the stone barrier on the opposite side is about 300 yards wide.

Salamis Islet is on the southern side of the fairway in a position nearly 2 miles west-northwestward of West Brother Islet. Pass Islet is on the northern side of the fairway about 600 yards north-northwestward of Salamis Islet; Oriental Rock, on the same side of the fairway, lies about 400 yards southwestward of Pass Islet, and is marked by a red spar beacon, surmounted by a day mark, 14 feet high. Vessels must pass not less than 35 yards southward of this beacon.

Kinpai Pass is one of the critical parts of the channel to Pagoda Anchorage. The mainland forms the northern side of the pass; the southern side is formed by the northern extremity of Wufu Island. Near this extremity is a flagstaff. The pass is entered from the eastward between Salamis Islet and Oriental Rock. Vessels without local knowledge should not proceed through Kinpai Pass; vessels with local knowledge should proceed through the pass only at slack water. The pass is particularly dangerous at or near spring tides, as the rapid tidal currents then cause eddies that at times set across the channel, and complicate steering. Vessels should avoid meeting or passing each other in Kinpai Pass; those proceeding against the current must wait clear of the pass until those going with the current are clear.

Wolverine Rock, over which the depth is $1\frac{3}{4}$ fathoms, lies close westward of the northern extremity of Wufu Island. Middle Ground extends nearly 1 mile westward from a position close westward of

Wolverine Rock. The least depth over Middle Ground is 4 feet. The channel southward of this shoal has silted up; the fairway, northward of the shoal, is deep. A black truncated conical buoy, known as Kinpai Middle Ground Buoy, marks the northern edge of Middle Ground.

Li Shih, a rocky shoal with a least depth of 9 feet, lies near the western end of Middle Ground, nearly in mid-river.

Rocky Head is a point on the northern bank of the river about $1\frac{3}{4}$ miles westward of the northern extremity of Wufu Island. Wedge Islet lies about $1\frac{1}{2}$ miles south-southwestward of Rocky Head on the outer edge of a narrow bank extending from the western bank of the river. A clump of trees in a village about 600 yards northward of Wedge Islet is conspicuous. A bank drying in patches extends more than halfway across the river from the northwestern side of Wufu Island along this section. The outer edge of this bank, sometimes called Wufu Island Shoal, is marked by a black spar buoy; the latter is situated about 800 yards southward of Wedge Islet. Halftide Rock, which covers 5 feet at high water springs, lies on the southern part of Wufu Island Shoal in a position about 1 mile southward of Wedge Islet; a black granite beacon marks Halftide Rock.

Stevens Point is on the western bank of the river in a position about $1\frac{1}{2}$ miles southwestward of Wedge Islet. A reef extends about 100 yards southeastward from this point; the outer end of the reef is marked by a red pole beacon surmounted by a day mark. Vessels must clear this beacon by at least 200 yards.

Hsing feng chiao, a rocky ledge, lies close off the western bank about $\frac{3}{4}$ mile south-southwestward of Stevens Point. The least depth on the ledge is 3 feet; a red buoy is moored close eastward of it.

Mingan Pass is a section of the river, about 3 miles long, entered about $\frac{3}{4}$ mile southward of Hsing feng chiao. The width of the river along this section is 600 yards; the banks are fairly steep-to. The land within the pass is high. Couding Islet is close off the western bank about midway through Mingan Pass; on the islet is a conspicuous white mark. Scout Rock, over which the depth is less than 6 feet, lies close eastward of Couding Islet. Vessels proceeding down the river with the out-going tidal current must guard against an eddy setting onto Scout Rock.

Taseu (Spiteful) Islet lies on the eastern side of the inner end of Mingan Pass. The islet is covered with vegetation, which usually imparts to it a light color. A red pole beacon stands on the summit of the islet. A spit, with depths of 3 fathoms and less, extends about 600 yards northward from Taseu Islet. Flat Islet, about 600 yards southward of Taseu Islet, is connected to the latter by a drying flat. A conspicuous tree stands near the southern end of Flat Islet. Hurst Rock, over which the depth is 4 feet, lies on a rocky ledge extending

about 100 yards southwestward from the western side of Taseu Islet. A black **buoy** marks the western edge of the ledge. Niu Tiu Rock, with a least depth of 3 feet, is a patch of rocky ground lying about 400 yards westward of Taseu Islet. The intervening channel has silted up. A red **buoy** is moored off the eastern side of Niu Tiu Rock, and a black **buoy** is moored off the western side of the rock. In 1935 the fairway lay westward of the black buoy.

Watters Rock lies about 200 yards off the eastern bank of the river in a position about 1½ miles above Flat Islet. A white pole **beacon**, surmounted by a sphere, stands on Watters Rock.

PAGODA ANCHORAGE (*B. A. Chart 1761*).—Pagoda (Ma wei) Anchorage is a section of the Min River about 22 miles within the outer bar. It is the principal port for Foochow, which lies about 11 miles farther upriver.

Depths.—In 1937 the largest vessel to reach Pagoda Anchorage drew 22 feet 4 inches on entering, and 24 feet 3 inches on clearing.

The river is generally highest during the northeast monsoon, and lowest during the southwest monsoon.

Harbor.—The southeastern bank of the river forms a point in a position about 600 yards southwestward of Watters Rock. A flagstaff marks this point. The lower limit of the harbor is a line extending to the northwestern bank from a position just below this flagstaff.

Customs Point is about ¼ mile farther upriver along the southeastern bank. A flagstaff marks Customs Point; the local customs house is nearby.

The Min River divides at a point about 1 mile westward of Customs Point. One branch, the Nan Kiang, trends westward; the other branch, the Pei Kiang, trends northwestward to Nantai Harbor (p. 452). Partly drying sand banks front the point where the Min River divides; these banks are extending eastward toward Customs Point. The changes in these banks are most rapid after freshets.

On the northeastern bank, in a position about ¾ mile north-northwestward of Customs Point, is Lo-hsing-ta, a village near a hill 93 feet high. A pagoda, 92 feet high, stands on this hill. A conspicuous chimney is close northeastward of Lo-hsing-ta. Lo-hsing-ta is at the southwestern extremity of Lo-hsing Island; the narrow channel between the island and the mainland to the northwestward dries.

A drying bank extends from the southeastern side of Lo-hsing Island between Lo-hsing-ta and a position about 2½ miles northeastward. Cultivated portions of this bank are always above water. The bank is continually changing. A red spar **buoy** is moored off the eastern edge of the bank in a position about 400 yards west-northwestward of the beacon on Watters Rock.

Pagoda Rock, a pinnacle drying 8 feet, is about 400 yards southward of Lo-hsing-ta. Foul ground extends as far as 50 yards westward

from the rock. A **light** (see Light List), is shown from a red iron pile beacon, surmounted by a daymark and 25 feet high, on Pagoda Rock.

Ma-wei (Mamoi) is a large village nearly ½ mile northwestward of Lo-hsing-ta within Ma-wei Point, the eastern point of the entrance to the Pei Kiang. Ma-wei Rock, a pinnacle drying 11 feet, lies off the village and a short distance westward of this point. The intervening channel is obstructed by a small rock. A **light** (see Light List), is shown from a red beacon, surmounted by a daymark, on Ma-wei Rock. This light is unreliable; the maintenance crew cannot approach the rock in bad weather.

The upper harbor limit is a line extending westward from Ma-wei Point.

Anchorage.—Vessels moor in swinging berths off the southeastern bank under the direction of the harbor master or the pilot. The recommended method of mooring is to use two anchors with 45 fathoms of chain to each.

The berths are numbered; a conspicuous number board is erected on the foreshore abreast each berth. The number of the berth allotted to a vessel arriving at Pagoda Anchorage is indicated by flags displayed at the customs house. Berths Nos. 1 to 11 are indicated by hoisting flags "A" to "K" under flag "Z" of the International Code. The berths lie off a section of the southeastern bank from Customs Point to a position about 700 yards northeastward of Watters Rock.

All vessels lying in swinging berths must exhibit two bright lights from sunset to sunrise; the riding light must be not less than 20 feet above the deck and in the position where it can best be seen; the other light must be at the stern.

Quarantine regulations.—A vessel with an infectious or contagious disease on board must remain below the lower harbor limit. The quarantine flag of the International Code of Signals must be displayed at the fore. No one must be allowed to board or leave the ship without permission from the authorities.

Anchorage for vessels with dangerous cargo.—Vessels laden with explosive or inflammable cargo must exhibit a red flag at the fore by day and a red light at night. They must anchor 1 mile below the lower harbor limit.

The harbor master will issue instructions regarding discharge of such cargo.

Storm signals.—Storm signals according to the supplementary system (p. 31) are displayed on the customs house flagstaff.

Port signals.—The system of port signals in use in Pagoda Anchorage is described on page 41.

Tidal currents.—The tidal currents at Pagoda Anchorage run in the direction of the deep channel at a rate of 1 to 3 knots according to

the age of the moon. The outgoing currents during freshets attain a rate of over 5 knots; in the confined portions of the river, particularly between Taseu Islet and Mingan Pass and in Kinpai Pass, the current often attains a rate of over 7 knots.

The ingoing current begins $5\frac{1}{4}$ hours before high water, and the outgoing current 1 hour after high water. After heavy rains in the interior, however, the outgoing current commences earlier and at times overcomes the ingoing current altogether. Freshets occur occasionally after heavy rain in June, July, and August. In August, 1886, vessels in Pagoda Anchorage did not swing to the ingoing current for 3 days; several dragged their moorings.

The height of the tides, and the times of the turning of the currents, are influenced by the direction and force of the wind.

Pilots.—The pilot service is under the administration of the harbor master at Pagoda Anchorage. The pilots are Chinese. The river should not be entered without a pilot.

The pilots cruise off Matsu Road during the northeast monsoon. During the southwest monsoon they cruise between Matsu Road and the outer bar in the Min River entrance. If forced to take shelter during the southwest monsoon the pilots proceed to Pirie Bay, on Matsu Island. When the pilots are unable to cruise a vessel should approach Matsu Road and sound five blasts on the siren or whistle.

The pilot boats are painted yellow; there are no distinguishing marks on the hulls or sails. When on duty they fly a flag, the upper half of which is white and the lower half red. Only licensed pilots should be engaged.

It is not considered necessary for vessels drawing less than 13 feet to employ a pilot when leaving Pagoda Anchorage, provided that all the buoys are in position and have been checked on the trip up the river.

Directions.—The fairway over the outer bar passes close southward of Entrance Buoy, Central Buoy, and Inner Buoy. The fairway passes also southward of the buoy marking Eme Rock, and thence between the buoy marking Temple Rock, and the buoy marking the stone barrier extending northwestward from Wild Duck Rock. Care must be taken to avoid Zephyr Rock, off Woga Point.

A westerly course should be steered so as to pass northward of Salamis Islet, and not less than 35 yards southward of the beacon on Oriental Rock. One long blast on the siren or whistle must be sounded when approaching Kinpai Pass whether bound up river or down river. Note that the power vessel going with the current is entitled to proceed through Kinpai Pass before another power vessel going against the current.

The fairway then leads between the mainland to the northward and the buoy marking Middle Ground to the southward. A vessel

after passing this buoy should steer 238° for the conspicuous clump of trees in the village about 600 yards northward of Wedge Islet until the eastern extremity of Wedge Islet bears 222° . The islet should be approached on that course until a course of 211° can be steered so as to pass fairly close eastward of the islet.

A vessel must sound one long blast on the whistle or siren when approaching Mingan Pass, just as in the case of Kinpai Pass. The regulation regarding current and vessels passing each other in Mingan Pass is also the same as the Kinpai Pass regulation.

After passing through Mingan Pass vessels should pass close westward of the buoy moored off the western side of Niu Tiu Rock. A course of 201° for the beacon on Watters Rock should then be steered; course should be altered so as to pass westward of the rock into Pagoda Anchorage.

It is said that the best time for a vessel with a speed of 10 knots to arrive at the outer bar is at high water. In March 1935, a British naval vessel arrived off Entrance Buoy at high water and encountered slack water throughout the passage to Pagoda Anchorage.

Caution.—The directions just given are based on information received in 1933. Changes are constantly taking place in the channel over the bars and in the river, and caution should be exercised.

It is necessary to guard against the tidal current eddies in Kinpai Pass and Mingan Pass.

SETTLEMENTS ($25^\circ 59' N.$, $119^\circ 27' E.$, *B. A. Chart 1761*).—The principal towns adjacent to Pagoda Anchorage are Ma-wei and Lo-hsing-ta. These towns lie within 1 mile of each other northwestward of Customs Point.

Wharves.—There are two T-head wharves close westward of Lo-hsing-ta; one is $182\frac{1}{2}$ feet long and has a depth alongside of 14 feet, and the other is 260 feet long and has a depth alongside of 23 feet.

Lighters are available for handling the cargo of vessels at moorings.

Repairs.—The government yard close northward of Ma-wei has a machine shop where large repairs can be made; the shop is fitted with modern appliances. Steam-operated sheer legs are available capable of lifting 50 tons.

A sea going tug with a pumping capacity of 150 tons per hour is maintained at the government yard.

Divers and diving gear are available.

Drydocks.—There is a drydock at Lo-hsing-ta, and another at the government yard. There is a side slip at the latter.

Supplies.—Fresh provisions are plentiful.

Large quantities of coal can be supplied in baskets from lighters; the rate of delivery is about 40 tons per hour.

Fuel oil can be obtained. It is pumped aboard from lighters.

Fresh water is available. The river water can be used in boilers after being allowed to stand in settling tanks.

Communications.—Mamoi is connected with the general telegraph system.

Cablegrams are relayed to countries overseas from a station on Sharp Peak Island.

Hospital.—There is a small general hospital.

THE MIN RIVER FROM PAGODA ANCHORAGE TO NANTAI HARBOR (*B. A. Chart 1761*).—The northern branch of the Min River trends generally northwestward from Pagoda Anchorage to Nantai Harbor. The southern branch trends westward at first, and

then northward to join with the other branch some distance above Nantai Harbor.

Depths.—In February, 1934 the local conservancy board stated that the fairway from Pagoda Anchorage to Nantai Harbor had been dredged to a minimum depth of 17 feet at high water neap tides, and 20 feet at high water spring tides, over a maximum width of 200 feet. This authority stated that with such tides vessels drawing not more than 15 feet and 18 feet, respectively, could proceed to Nantai Harbor. The conservancy project included construction of training walls.

It is possible that the depths mentioned may not always be maintained; silt is deposited continually. It is reported that in 1936 a vessel drawing 20 feet berthed at a pontoon in Nantai Harbor; the largest vessel to arrive during 1937 drew 12 feet.

NANTAI HARBOR ($26^{\circ}03' N.$, $119^{\circ}19' E.$, *B. A. Chart 1761*) is a section of the northern branch of the Min River, sometimes called the Pei Kiang, about $8\frac{1}{2}$ miles above Pagoda Anchorage. The harbor lies between the mainland to the northward and the northern shore of Nantai Island, the large island formed between the two branches of the river. The town of Nantai, abreast the harbor, is in about the middle of the northern shore of this island. A large suburb of Foochow is on the northern side of the river abreast Nantai.

Depths.—The depths in a mooring area in Nantai Harbor were 13 to 18 feet in 1934.

Harbor.—The upper limit of Nantai Harbor is a stone bridge crossing the river from Nantai to the Foochow suburb. The lower limit of the harbor is Siemssen Island, which lies with its upriver extremity about 1,800 yards below the bridge.

Moorings.—Several mooring buoys are available in Nantai Harbor. Vessels moor bow and stern.

The passage between the lines of mooring buoys is indicated by marker buoys.

Tides.—The mean high water interval in Nantai Harbor is 0h. 30m.; the mean range is 15.8 feet, and the spring range is 19.4 feet.

Pilots.—Pilots are available for the run from Pagoda Anchorage to Nantai Harbor. The pilot service is under the administration of the Pagoda Anchorage harbor master.

Foochow ($26^{\circ}05' N.$, $119^{\circ}18' E.$, *B. A. Chart 1761*) lies about 2 miles within the northern shore of Nantai Harbor. Foochow is the principal trading center in the northern part of the province of Fukien. Most of the Europeans live in Nantai, the town on the southern shore of Nantai Harbor. The population of Foochow was 348,280 in 1938. The United States is represented by a consul.

A radio station in Foochow is open to public correspondence. One hospital in Nantai has a capacity of 126 beds; there are three smaller hospitals. Two hospitals in Foochow, each with over 100 beds, will accept seamen.

CHAPTER VII

MIN RIVER TO AMOY

COAST FROM THE MIN RIVER ENTRANCE TO RODD HEAD (*B. A. Chart 1761*).—From Sand Peak Point, the southern point of the entrance to the Min River, to Rodd Head, a distance of about $20\frac{1}{4}$ miles, the coast trends generally south-southwestward. Rodd Head is the western point of the entrance to Haitan Strait from the northward. The coast between Sand Peak Point and Rodd Head consists of a sandy beach. The coast between Sand Peak Point and Niu To, a section about 7 miles long, forms the western side of the approach to the Min River from the southward; this section has been described in the preceding chapter.

Coast.—Cows Horn Point ($25^{\circ}45' N.$, $119^{\circ}38' E.$, *H. O. Chart 3204*) is about $9\frac{1}{4}$ miles south-southwestward of Niu To; the intervening coast is a sandy beach.

Cows Horn Peak (see view C on *H. O. Chart 3204*) is a remarkable summit, 1,260 feet high, about $1\frac{1}{4}$ miles west-southwestward of Cows Horn Point.

Rodd Head lies about 4 miles south-southwestward of Cows Horn Point. The land just within the point rises abruptly to peaks as high as 630 feet.

Off-lying islands and dangers.—The Tessara Islands lie east-northeastward of Cows Horn Point. The largest island of the group is about $\frac{1}{2}$ mile in diameter, and attains a height of 221 feet. The channel between Cows Horn Point and this island is about 2 miles wide, and is obstructed by Fairway Islet, 183 feet high. There are depths of about 7 fathoms between the islet and Cows Horn Point. The depths as far as 800 yards southward of the islet are less than 5 fathoms; a $1\frac{1}{4}$ -fathom patch lies about $1\frac{1}{4}$ miles south-southwestward of the islet. A drying reef lies about 600 yards southeastward of the islet.

The channel between Fairway Islet and the largest Tessara Island is narrowed by two drying rocks that lie about 600 yards off the western shore of the latter island. A reef extends about 1 mile eastward from this island; an islet, 95 feet high, lies on the northeastern part of this reef.

Great Dragon Islet, 142 feet high, lies about $\frac{3}{4}$ mile northeastward of the largest of the Tessara Islands, and is almost connected to the latter by reefs.

Brown Rock, 90 feet high, lies about $1\frac{1}{2}$ miles north-northeastward of Fairway Islet. The rock is cleft.

Namoa Rock, over which the depth is 4 feet, lies about $\frac{1}{2}$ mile westward of Brown Rock.

The passage between the Tessara Islands and the mainland is rarely used, and is, moreover, considered unsafe for vessels of any size. However, directions prepared by one authority for vessels proceeding northward through Haitan Strait include directions (p. 465) for passing between Fairway Islet and the mainland after leaving the strait.

HAITAN STRAIT (*H. O. Chart 3204*).—The western side of this strait is formed by the mainland and numerous off-lying islands between Rodd Head and Vangan Point, about 21 miles southward. The eastern side of the strait is formed principally by the western shore of Haitan Island; there are numerous other islands and islets on this side of the strait also.

Haitan Strait is nearly $1\frac{1}{2}$ miles wide across its narrowest part. It is, however, greatly encumbered by islets, rocks, and shoals, with only narrow passages between them.

In the southern entrance to the strait is a convenient typhoon anchorage.

Vessels drawing more than 22 feet should not proceed through Haitan Strait because, if delayed so that advantage cannot be taken of the rise of the tide, they would probably ground. A vessel should have about 6 feet of clearance. In Wilson Channel, on the western side of the middle portion of Haitan Strait, the bottom is sandy and the tidal currents are strong. Here small knolls form and tend to shift.

The entrance to Haitan Strait from the northward is known as North Entrance; the entrances from the southward are Southeast Entrance and South Entrance.

NORTH ENTRANCE (*H. O. Chart 3204*).—The entrance to Haitan Strait from the northward leads southeastward and southward of the Tessara Islands, and northward and northwestward of Haitan Island. There are several out-lying dangers.

Chung Island, Slut Island, Shingan Island, Dori Island, and Tatong Island lie generally westward of the northern extremity of Haitan Island. There are deep channels into the strait between these islands, but only one, between Slut Island and Shingan Island, is in general use.

Outlying dangers.—Norton Rock ($25^{\circ}46' N.$, $119^{\circ}48' E.$, *H. O. Chart 3204*) lies about 7 miles eastward of the largest of the Tessara Islands. Norton Rock is 52 feet high. A rock, over which the depth is less than 6 feet, lies about 200 yards northwestward of Norton Rock, and about $\frac{1}{2}$ mile farther northwestward is a 6-fathom patch.

Bassett Rock lies about 4 miles southeastward of Norton Rock. Bassett Rock is a pinnacle over which the depth is 3 fathoms.

Waif Rock, 48 feet high, lies about $3\frac{1}{2}$ miles southwestward of Norton Rock. The northern side of Waif Rock is steep-to, but rocks lie off the other sides. A reef, drying about 24 feet, lies about $\frac{3}{4}$ mile south-southwestward of Waif Rock.

Red Rock, 30 feet high, lies about $2\frac{1}{4}$ miles westward of Waif Rock. Foul ground surrounds Red Rock as far as $\frac{1}{2}$ mile in places. Between the rock and the northwestern extremity of Tatong Island are several islets and shoals.

Warning Rocks, consisting of a group of two rocky islets and several rocks above and below water, lie southwestward of Bassett Rock. The northern islet of the group, about $1\frac{1}{2}$ miles from Bassett Rock, is 107 feet high. A rocky reef, part of which dries 3 feet, lies about 1 mile southwestward of the southern islet. The channel between the latter islet and the northern islet is about 600 yards wide, and is encumbered by numerous dangers.

Vessels should not proceed into the area lying southward of a line joining the northern Warning Rock, Waif Rock, and Red Rock.

Chung Island lies with its northeastern extremity about $1\frac{3}{4}$ miles south-southeastward of Rodd Head. The island is about 3 miles long in a northeast and southwest direction, and is about $\frac{3}{4}$ mile wide. A rocky spit, with some rocks above water, extends over $\frac{3}{4}$ mile northeastward from its northeastern extremity. A summit in about the center of the island is 150 feet high.

Slut Island (see view D on *H. O. Chart 3204*) is a small island, 170 feet high, lying close southeastward of the spit extending northeastward from Chung Island; in a position nearly 2 miles southeastward of Rodd Head. The summit of Slut Island, when seen from the southward, is a boulder painted white with a black vertical stripe; there is a light-colored patch on the western shoulder of the island.

Two **beacons**, consisting of white pyramidal concrete structures 300 yards apart, are situated on the southeastern slope of Slut Island. These beacons, the painted boulder on the summit of Slut Island, and Cows Horn Peak, are in range bearing 351° .

A spit, with depths of $3\frac{1}{4}$ to 5 fathoms, extends about $1\frac{1}{2}$ miles north-northeastward from Slut Island; a 2-fathom patch on this spit is about 800 yards north-northeastward of the eastern extremity of the island. A $2\frac{1}{4}$ -fathom patch lies about 800 yards east-northeastward of the same extremity.

An islet lies about $1\frac{1}{2}$ miles northward of Slut Island. Within a distance of $1\frac{1}{4}$ miles north-northeastward of the islet are two drying reefs.

A bank, with a depth of 3 feet at its outer end, extends about 1,200 yards southward from Slut Island. A rock, over which the

depth is 6 feet, lies on the western edge of this bank in a position about 400 yards southward of the southwestern extremity of the island.

Mitre Rock, about $\frac{3}{4}$ mile southward of Slut Island, is 20 feet high.

The beacons on Slut Island, in range and bearing 351° , lead between Mitre Rock and the dangers, on the eastern side of the fairway through North Entrance, extending southwestward from Dori Island.

Shingan Island lies with its southwestern extremity about 1,200 yards eastward of Slut Island. Shingan Island is nearly $1\frac{1}{4}$ miles long in a northeast and southwest direction, and is rather narrow. Shing Rock, 90 feet high, lies about 1,200 yards northeastward of the northeastern extremity of the island, and is connected to the latter by a rocky reef. A rock, over which the depth is less than 6 feet, lies about $\frac{1}{2}$ mile northeastward of Shing Rock; a wreck visible at low water, lies on this rock. A 3-fathom patch lies between the wreck and Shang Rock.

Simpson Spit, with depths of $3\frac{3}{4}$ to 4 fathoms, extends about 2 miles northward from the northwestern side of Shingan Island across Northern Entrance. A patch of $2\frac{1}{2}$ fathoms on Simpson Spit lies about 1,400 yards northwestward of the northeastern extremity of Shang Rock. Shoal water extends about 400 yards westward from the western side of Shingan Island.

Dori Island lies southeastward of Shingan Island. The intervening channel is about 600 yards wide, and the depths vary from $2\frac{1}{4}$ fathoms to 14 fathoms.

Rocks drying 8 feet rise from a large patch of rocky, foul ground that lies within a distance of $\frac{3}{4}$ mile west-southwestward of the southwestern extremity of Dori Island. There are irregular depths, with patches of foul ground, as far as $1\frac{1}{2}$ miles south-southwestward of the same extremity; a rock drying 2 feet lies nearly 1 mile from this point.

Tatong Island is about $3\frac{1}{4}$ miles long in an east and west direction, and is about $1\frac{1}{2}$ miles wide. Its northwestern shore is separated from Dori Island to the northwestward by a channel with a minimum width of about 600 yards. A rock drying 16 feet lies in the southwestern part of this channel, and vessels should not proceed through it. The summit of Tatong Island, a peak 750 feet high, is in the southeastern portion of the island.

A bank, with depths less than 2 fathoms, extends about $1\frac{1}{2}$ miles southwestward from the southwestern shore of Tatong Island. Inner Rock, near the outer edge of this bank, is 30 feet high; Three Rocks, a cluster about $\frac{3}{4}$ mile westward of Inner Rock, are 2 to 6 feet high.

Tower Rock (for principal description see p. 457), 28 feet high, lies about 1 mile southwestward of Inner Rock.

The channel between Tatong Island and Haitan Island to the southeastward (for principal description see p. 466) is about $\frac{1}{2}$ mile wide. The channel is deep but is obstructed by Long Island and Button

Islet. Long Island, 165 feet high, lies in the northeastern entrance to this channel in a position about 2 miles eastward of Tatong Point, the northeastern extremity of Tatong Island. There are numerous reefs around Long Island. Button Islet, 40 feet high, lies in mid-channel about $3\frac{1}{4}$ miles southwestward of Long Island.

CHANNELS THROUGH HAITAN STRAIT—THE NARROWS (*H. O. Charts 3204 and 3206*).—Vessels can proceed through the northern part of Haitan Strait by way of Wilson Channel or Blind Channel. Near the southern end of the strait these channels converge to form a section called The Narrows.

Wilson Channel lies between a shoal bank extending off the mainland to the westward and, to the eastward, a long, narrow bank, or middle ground, trending through Haitan Strait. The southern portion of this bank consists of an eastern fork and a western fork; Blind Channel lies between these forks.

Blind Channel is wider and deeper than Wilson Channel, but at its northern end the fairway over the bank has a depth of only $2\frac{1}{4}$ fathoms. Wilson Channel is the recommended route through Haitan Strait; there are reliable marks for the fairway.

The depths over the bank separating Wilson Channel from Blind Channel are almost everywhere $2\frac{1}{2}$ fathoms or less.

Wilson Channel.—Tower Rock ($25^\circ 37' N.$, $119^\circ 38' E.$, *H. O. Chart 3204*) lies near the northern extremity of the long, narrow bank that trends northward and southward through Haitan Strait. Tower Rock is 28 feet high, and has a flat top with a deep embrasure. A smaller rock lies about 200 yards westward of Tower Rock.

The western side of the northern part of Wilson Channel is formed by a sand bank, drying in patches, that extends off the mainland as far as $1\frac{1}{4}$ miles. A mainland summit, Shearburn Peak, lies about 3 miles southward of the southwestern extremity of Chung Island. Shearburn Peak is 463 feet high. Talisman Peak, also on the mainland, is 304 feet high, and lies about $1\frac{1}{2}$ miles south-southeastward of Shearburn Peak.

Round Islet (see view B on *H. O. Chart 3206*), 147 feet high near its northeastern extremity, lies on the sand bank extending from the mainland on the western side of Wilson Channel in a position about $1\frac{1}{2}$ miles eastward of Shearburn Peak. St. Hilaire Islet, 27 feet high, lies about 800 yards east-southeastward of Round Islet. There are numerous rocks around St. Hilaire Islet.

Black Rocks, a group with one rock 20 feet high, lie about $2\frac{3}{4}$ miles southeastward of Talisman Peak. The depths on the western side of Wilson Channel are over 3 fathoms about 200 yards eastward of Black Rocks.

Charles Islet, 49 feet high, lies about 700 yards westward of Black

Rocks. The summit of Charles Islet is marked by a large boulder. A pagoda, 68 feet high, marks a village about $1\frac{1}{2}$ miles west-southwestward of Charles Islet.

The four Rocky Islands, with numerous rocks around them, lie on the western side of Wilson Channel; the northernmost and largest, 33 feet high, is nearly $\frac{3}{4}$ mile southward of Charles Islet. The group is compact.

From abreast the Rocky Islands the western side of Wilson Channel trends generally south-southeastward a distance of about $3\frac{1}{2}$ miles to a position abreast Flag Islet. This islet, 68 feet high, is in about the middle of Haitan Strait. Wilson Channel and Blind Channel unite immediately southward of Flag Islet. Reefs extend as far as 500 yards southward and as far as 300 yards northward from the islet. A rock, 12 feet high, lies close northward of its northern shore. A vessel proceeding northward through Wilson Channel can pass safely within a distance of 200 yards of the western shore of Flag Islet; a vessel proceeding northward toward Blind Channel can pass safely within a distance of 200 yards of the eastern shore of the islet.

Blind Channel.—Pillar Rock ($25^{\circ}35' N.$, $119^{\circ}41' E.$, *H. O. Chart 3206*) lies on the eastern side of Haitan Strait in a position about $2\frac{3}{4}$ miles southeastward of Tower Rock. Pillar Rock is 90 feet high. Close westward of it is an islet 40 feet high.

Tricker Rock lies about 1 mile south-southwestward of Pillar Rock. The northern end of Blind Channel is about $\frac{3}{4}$ mile westward of Tricker Rock. This rock dries 20 feet. Some rocks lie close off its southeastern side; a 2-fathom patch lies about 350 yards south-southeastward of it.

Middle Island is less than $\frac{1}{2}$ mile northward of the southern end of Blind Channel in a position about $3\frac{1}{2}$ miles southward of Tricker Rock. A rock 7 feet high lies about 300 yards northward of the eastern extremity of Middle Island, and about the same distance east-northeastward of the same extremity is an islet 66 feet high. A drying bank extends over 300 yards southward from the southern extremity of Middle Island. A **beacon**, consisting of a white stone cairn, stands on the 7-foot rock northward of Middle Island.

Two groups of rocks, separated by a narrow channel with a least depth of 7 fathoms, lie on the eastern side of the entrance to Blind Channel between $\frac{1}{2}$ and $\frac{3}{4}$ mile southwestward of Middle Island. A rock in the western group dries 8 feet; a rock in the eastern group dries 4 feet.

The Saxby Islets, a group of islets and rocks, lie within a distance of 1 mile east-northeastward of Middle Island. The largest islet is 15 feet high. A **beacon**, consisting of a white stone cairn, stands on this islet.

Town Point, on Haitan Island, is about $\frac{1}{2}$ mile eastward of the largest

of the Saxby Islets. This point is the southern point of the entrance to a channel leading to Haitanchin (Pingtan), a town near the eastern shore of Haitan Island. Sand Hill, 171 feet high, is on the northern side of this channel in a position about 2 miles east-northeastward of Town Point.

Hill Island, 189 feet high, lies about 1,200 yards southward of Middle Island, and close off the shore of Haitan Island.

Channel Rock, 10 feet high, is on the eastern side of the fairway in a position about 700 yards southwestward of Hill Island. Shoal water extends nearly 200 yards northward from Channel Rock.

The Narrows.—The Narrows is a section of Haitan Channel near its southern end where it reduces to minimum width.

Pass Island ($25^{\circ}27' N.$, $119^{\circ}40' E.$, *H. O. Chart 3206*) is on the western side of the fairway in about the middle of The Narrows. Pass Island, 126 feet high, is less than 2 miles south-southeastward of Flag Islet. Little Pass Island lies close northwestward of the island, and is connected to it by a narrow ridge of boulders and gravel. Both islands rise from an extensive sand bank, parts of which dry as much as 3 feet. Pass Rocks lie about 400 yards eastward of the northern extremity of Pass Island. These rocks dry 20 feet. The channel between Pass Island and Pass Rocks is deep, but it is not recommended. There are two pyramidal concrete **beacons** on the eastern side of Pass Island. The front beacon is white, and the rear beacon is black; the beacons are in range bearing 159° . An iron tripod **beacon**, surmounted by a sphere 6 feet in diameter, stands near the northern extremity of Pass Rocks. The total height of the structure is 26 feet, and at least 12 feet of it shows above high water. The entire structure is painted black.

Low Islet, 33 feet high, is on the eastern side of the fairway through The Narrows in a position about $\frac{3}{4}$ mile northeastward of Pass Island. A rocky ledge extends nearly 300 yards southward from Low Islet.

Ashuelot Rocks lie on the eastern side of the fairway about 500 yards westward of Low Islet. The three Ashuelot Rocks have over them depths of 4 feet, $1\frac{1}{2}$ fathoms, and $3\frac{1}{4}$ fathoms, respectively. The depths around are 6 fathoms; at low water the rocks are plainly marked by overfalls.

Abbott Island, 93 feet high, lies about 600 yards eastward of Low Islet. Dyantau Bay is the northern part of an extensive shoal inlet indenting the shore of Haitan Island; the bay is entered northward of Abbott Island.

Junksail Islet (see view A on *H. O. Chart 3206*) lies nearly $1\frac{1}{4}$ miles southeastward of Pass Island on the eastern side of The Narrows. The islet is 35 feet high. Junksail Rock, 39 feet high, lies close off the southeastern extremity of the islet. The islet lies on the northern

side of the entrance from southward to a large inlet filled by flats and islets.

Station Island, 59 feet high, is on the eastern side of The Narrows about $1\frac{3}{4}$ miles southeastward of Junkisail Islet. Station Island is often difficult to make out until close to it; a useful mark nearby is a conspicuous patch of white sand on the shore of Haitan Island about $\frac{3}{4}$ mile northward of the island. The sides of the island slope, so that at low water the island appears twice the size it shows at high water.

Edmond Reef lies about 800 yards northwestward of Station Island, and dries 15 feet. A drying sandspit extends about $1\frac{1}{2}$ miles in a northwesterly direction from the shore of Haitan Island eastward of Edmond Reef.

A reef drying 20 feet lies about 400 yards southward of Station Island.

There are depths of 3 fathoms and under on the eastern side of The Narrows outside a line joining the western shores of Junkisail Islet and Low Islet.

On the mainland on the western side of The Narrows is Tyne yung Shan (see view A on *H. O. Chart 3204*), a remarkable, steep hill, 962 feet high. This hill is about $2\frac{1}{4}$ miles west-northwestward of Pass Island. Quoin Hill, about 1,200 yards eastward of Tyne yung Shan, is 330 feet high, and appears wedge-shaped on northerly and southerly bearings. Mount Burnie, 1,326 feet high, lies about $2\frac{1}{2}$ miles southwestward of Pass Island, and is conspicuous.

Ko-mor Island is on the western side of The Narrows abreast Mount Burnie. A hill in the southern portion of the island is 237 feet high. Young Islet lies about 600 yards eastward of Ko-mor Island, and is 172 feet high. An islet 30 feet high lies close eastward of Young Islet. Young Islet lies on the northern outer edge of a bank, with depths less than 3 fathoms, extending from the western shore of The Narrows. The eastern edge of the bank trends as far as $1\frac{3}{4}$ miles southward from Young Islet.

Hive Islet lies about $\frac{1}{2}$ mile southward of the southern extremity of Ko-mor Island. Hive Islet is 199 feet high. An islet 60 feet high lies between Ko-mor Island and Hive Islet.

Anchorage in The Narrows.—There is good anchorage, in a depth of 4 fathoms, in a position with Station Island bearing 72° and the western side of Junkisail Islet bearing 328° .

Anchorage can also be obtained off Maiangkun Bay, on the eastern side of the northern part of The Narrows, in a depth of 6 fathoms. The recommended position is 1,200 yards from Low Islet, with the western side of this islet in range with the western side of Junkisail Islet, and bearing 155° . The bottom in this position is mud and sand.

SOUTHERN ENTRANCES TO HAITAN STRAIT (*H. O. Chart 3204*).—A group of islands, of which Chim Island and Sand Island are the largest, lies off the southern end of Haitan Strait. Southeast Entrance is the channel into Haitan Strait between these islands and the southern shore of Haitan Island to the northeastward; South Entrance is the channel between these islands and the mainland to the westward.

SOUTHEAST ENTRANCE.—Reef Island ($25^\circ 18' N.$, $119^\circ 45' E.$, *H. O. Chart 3204*) lies on the southwestern side of the outer portion of Southeast Entrance. Reef Island is 192 feet high near its northern extremity. A reef, with rocks above and below water on it, extends about $\frac{3}{4}$ mile northward from Reef Island; Long Reef, at the extremity of this reef, has on it a rock 4 feet high. An islet, 101 feet high, lies close off the eastern extremity of Reef Island, and is connected to the extremity by a drying reef. Another islet, and some rocks above and below water, lie within $\frac{1}{2}$ mile southeastward of the island.

Chim Rock, 42 feet high, lies nearly $1\frac{3}{4}$ miles northward of the northern extremity of Reef Island. North Chim Rock is 18 feet high, and lies about $\frac{3}{4}$ mile northward of Chim Rock. A rock lies about 200 yards northeastward of North Chim Rock.

South Reef is the outermost danger on the northeastern side of Southeast Entrance. The reef lies about 6 miles northeastward of Reef Island, and dries 13 feet. The sea breaks heavily over South Reef.

Trite Island, 90 feet high, lies about $2\frac{1}{2}$ miles north-northwestward of South Reef. The island has three summits. Some islets and rocks lie within a distance of 600 yards of the northwestern side of Trite Island. A shoal, with a depth of $2\frac{1}{2}$ fathoms or less, was reported (1907) in a position about 1 mile southeastward of Trite Island.

Haitan Point, the southern extremity of Haitan Island, lies about 3 miles northward of North Chim Rock. The point is the extremity of a rugged, sandy headland. The shore of Haitan Island west-northwestward of Haitan Point is fronted by a wide bank from which rise several rocks above and below water. Square Rock, on this bank, lies about $1\frac{1}{2}$ miles westward of Haitan Point, and is 18 feet high. Station Island, marking the southern end of The Narrows, is about 2 miles northwestward of Square Rock.

South Entrance.—Sentry Island ($25^\circ 17' N.$, $119^\circ 43' E.$, *H. O. Chart 3204*) lies on the northeastern side of the outer part of South Entrance. The island appears as two small islets when seen from the southeastward. The island attains a maximum height of 138 feet. A rock with a depth of 3 fathoms over it lies about $1\frac{1}{4}$ miles westward of the southwestern extremity of Sentry Island.

Comet Rock, over which the depth is 6 feet, lies nearly $1\frac{1}{2}$ miles east-southeastward of Sentry Island. Breaker Rock, drying 9 feet, is about 1,200 yards northeastward of Comet Rock.

Sedan Rock, the outermost danger on the northeastern side of South Entrance, lies about $2\frac{1}{4}$ miles southeastward of Sentry Island. The rock is steep-to, and has over it a depth of $1\frac{3}{4}$ fathoms.

Sand Island lies with its southern extremity about $2\frac{1}{2}$ miles northwestward of Sentry Island. Sand Island attains a height of 289 feet in a summit in about the center of the island. There are other isolated hills. The shores are sandy, and the island has a whitish color. Rocks extend nearly 1 mile southeastward from the southeastern side of the island. A large patch of foul ground, consisting of rocks above and below water, lies about midway between this island and Sentry Island. A rock, over which the depth is 6 feet, lies nearly 1 mile east-southeastward of the southern extremity of Sand Island. In 1929 a wreck, with masts and funnel above water, lay on this rock. Shoal water, with depths less than 5 fathoms, extends as far as $1\frac{1}{2}$ miles westward from the western shore of Sand Island.

The outermost danger on the southwestern side of South Entrance is Scattered Yits. The latter is a compact group of three rocks; the southwesternmost is 3 feet high, and lies about $4\frac{1}{2}$ miles southwestward of Sentry Island. A drying rock was reported (1937) about 300 yards southward of the southwesternmost of the Scattered Yits rocks.

The Double Yit islets consists of three islets lying west-southwestward of Sentry Island. The largest islet of the group is 105 feet high, and lies about $3\frac{1}{4}$ miles from Sentry Island. The other islets are close northward and eastward, respectively, of this islet. A rock, with a depth of 7 feet over it, was reported (1909) to lie about $\frac{3}{4}$ mile east-northeastward of the largest islet.

Hongkong Rock, over which the depths are less than 6 feet, lies about $1\frac{1}{4}$ miles northwestward of the largest of the Double Yit islets. The water over the rock is not discolored.

Volga Rock has a depth of 4 feet over it, and lies about $3\frac{1}{4}$ miles west-northwestward of the southern extremity of Sand Island. The tidal currents are strong near Volga Rock, and there are pronounced rippings.

Douglas Islet, 50 feet high, lies about 1,300 yards northward of Volga Rock. The islet rises from a shoal, with depths less than 3 fathoms, that extends from the southwestern side of the islet as far as 600 yards.

Vangan Point, on the mainland, lies about 1,200 yards northward of Douglas Islet. The land within the point consists of hills from 300 to 500 feet high. Nopass Rock, 15 feet high, lies on the western side of Southeast Entrance in a position about 1,300 yards eastward of Vangan Point. The channel between the point and the rock should

not be attempted. Nearly 2 miles northeastward of Vangan Point is a point, 116 feet high, with a pagoda on it. The walled village of Vangan lies close southward of the 116-foot point. Between this point and a point about 1 mile northward the mainland is indented by an inlet almost filled by a shoal flat. An islet, 69 feet high, and a larger islet with a fort on its eastern extremity, lie in the entrance to this inlet. Hive Islet (p. 460) lies about $\frac{3}{4}$ mile north-northeastward of the northern point of the entrance to the inlet.

Round Islet, 142 feet high, and Knob Islet, 190 feet high, lie on the eastern side of the channel through South Entrance. Both islets lie on the northern part of the bank extending westward from Sand Islet. A rock, 8 feet high, with some sunken rocks around, lies about 600 yards southwestward of Round Islet.

Chim Island, close northward of Sand Islet, is the highest land in this vicinity. There is a peak 769 feet high and a peak 525 feet high near the center of the island. On the higher summit are three chimneys, according to the chart, but in 1937 these could not be identified.

Tidal currents in Haitan Strait.—The tidal currents enter Haitan Strait during the rising tide by both the northern and southern entrances. The currents meet between the Rocky Islands and Middle Island; in this area, and also between Hill Island and Middle Island, there are heavy overfalls. These are dangerous to boats when the wind is strong. During the falling tide the tidal currents separate between the Rocky Islands and Middle Island and leave the strait by both the northern and southern entrances.

In the channel eastward of Pass Rocks the tidal currents run in the direction of the channel at a rate of 4 to 5 knots, but in the more open parts of the channel the rate is 2 to 3 knots.

The tidal current entering Haitan Strait by Southeast Entrance divides northward of Chim Island, one portion flowing north-northwestward, and the other south-southwestward.

At Sedan Rock, in March and April, the tidal currents set southwestward during the rising tide, and southeastward during the falling tide, with a maximum rate of about $2\frac{1}{4}$ knots.

Directions for Haitan Strait.—Vessels entering Haitan Strait by way of South Entrance should pass between Scattered Yits and Sedan Rock, and thence between the rock reported (1909) about $\frac{3}{4}$ mile east-northeastward of the largest of the Double Yit islets and the rock, over which the depth is 3 fathoms, westward of Sentry Island. A north-northwesterly course for Nopass Rock may be steered for when that rock is visible; when the southern extremity of Sand Island bears 112° the triangular patch of white sand on the southwestern coast of Haitan Island may be steered for bearing 27° until Junkisail Islet bears 353° .

Vessels entering Haitan Strait by Southeast Entrance should pass

about 1 mile northeastward of North Chim Rock, and thence steer west-northwestward so as to pass about 600 yards northward of Chim Island until Junk sail Islet bears 353° . Vessels approaching Southeast Entrance from the northeastward should, after rounding Hai Head (p. 467), pass about 600 yards southeastward of Trite Island, taking care to avoid the shoal about 1 mile southeastward of that island, and thence about 1 mile southward of Haitan Point, when a westerly or west-northwesterly course should be steered until Junk sail Islet bears 353° .

To proceed through Wilson Channel after entering by way of either entrance a vessel should steer for Junk sail Islet bearing 353° until the 30-foot islet eastward of Young Islet bears 270° . A north-northwesterly course should then be steered so as to pass about 800 yards westward of Junk sail Islet. A vessel should then steer to pass about 400 yards eastward of the beacon on Pass Rocks. When the western extremity of Station Island is in range with the eastern side of Junk sail Islet and bearing 136° (see view A on *H. O. Chart 3206*), a vessel should keep this range astern, passing between Pass Rocks and Ashuelot Rocks, until Tyne yung Shan bears 261° and is in range with Quoin Hill, and the beacons on Pass Island are in range bearing 159° . Note that vessels proceeding northward through the strait with the south-going tidal current must take care not to be set onto Pass Rocks. The beacons on Pass Island should be kept in range astern until the beacon on the largest Saxby Islet bears 84° and is in range with the beacon on the rock, 7 feet high, close northward of Middle Island. Note that when on the reach with the beacons on Pass Island bearing 159° astern Round Islet will be seen nearly ahead, bearing about 337° , and midway between Black Rocks and Charles Islet. (See view B on *H. O. Chart 3206*.)

From the intersection of the 159° stern range and the 84° range a vessel should alter course to pass about 600 yards eastward of Black Rocks; a useful mark is to keep the western side of Shingan Island bearing 359° and in range with the small rock close westward of Tower Rock. Care must be taken not to be eastward of this range; a narrow spit, with a depth of $1\frac{1}{2}$ fathoms on its western extremity, extends toward the fairway. The western extremity of the spit is about $1\frac{1}{2}$ miles westward of the beacon on 7-foot rock close northward of Middle Island.

The course with the western side of Shingan Island bearing 359° , and in range with the rock close westward of Tower Rock, should be held until Talisman Peak bears 270° . Cows Horn Peak should then be steered for bearing 352° and in range with the western shoulder of Slut Island. (See view C on *H. O. Chart 3204*.) Note that this shoulder of Slut Island is flat and does not form a very definite mark, so that the bearing on Cows Horn Peak should be carefully maintained. When Inner Rock bears 89° a vessel should steer 351° for

Cows Horn Peak, with the peak in range with the summit of Slut Island and with the beacons on that island. This course leads between Mitre Rock and the dangers southeastward. When Mitre Rock bears 270° a north-northeasterly course should be steered to pass midway between Slut Island and Shingan Island. A vessel should then bring Mitre Rock to bear 217° astern and in range with a dip in the hills behind the rock. (See view D on *H. O. Chart 3204*.) This course leads over Simpson Spit in a least depth of $4\frac{1}{2}$ fathoms, but it passes close to patches of $2\frac{1}{4}$ fathoms and $3\frac{3}{4}$ fathoms. The course should be followed carefully. When the northeastern extremity of Shing Rock bears 157° vessels will have cleared Simpson Spit, and course should be altered to pass southeastward of the Tessara Islands.

Vessels proceeding through Blind Channel should pass between Pass Rocks and Ashuelot Rocks as previously directed. When Low Islet bears 78° course should be altered to the northward so as to pass about 500 yards eastward of Flag Islet and then to the north-northwestward to bring the western side of Pass Island bearing 170° and in range with the eastern side of Flag Islet. This range should be kept on astern until the beacon on the largest Saxby Islet bears 84° and is in range with the beacon on the 7-foot rock close northward of Middle Island. Note that Sand Hill, east-northeastward of Town Point on Haitan Island, is also in range with these beacons bearing 84° .

From the intersection of the 170° stern range and the 84° range course should be altered to the eastward until the western side of Little Pass Island bears 174° astern and is in range with the eastern side of Flag Islet. This course should be held until Pillar Rock bear 34° and is in range with Tricker Rock.

If Tricker Rock is covered the pagoda west-southwestward of Charles Islet should be brought to bear 244° and in range with the latter islet.

From the intersection of the 174° stern range and the 34° range, or the 244° range as the case may be, a vessel should steer a northwesterly course across the middle ground at the northern end of Blind Channel until Cows Horn Peak bears 352° , when the directions already set forth can be followed.

Vessels proceeding westward of the Tessara Islands after clearing North Entrance should keep Mitre Rock bearing 217° astern, and in range with a dip in the hills in the background until Brown Rock bears 7° and is just open eastward of Fairway Islet. Brown Rock should be steered for on that bearing until Cows Horn Peak bears 292° , when course should be altered to pass about 400 yards westward of Fairway Islet. The western side of Fairway Islet should then be gradually brought to bear 188° astern, and in range with the western

side of Shingan Island. This course leads between Brown Rock and Namoa Rock. When Great Dragon Islet is open northeastward of Brown Rock a more easterly course can be steered.

HAITAN ISLAND (*H. O. Chart 3204*).—Haitan (Chu) Island is about 16 miles long in a north and south direction and about 10 miles wide. The shores of the island are indented by extensive bays. The salient points are generally hilly.

The northwestern and western shores of the island have been described with Haitan Strait.

Northeastern shore of Haitan Island.—Saiang Point ($25^{\circ}40' N.$, $119^{\circ}47' E.$, *H. O. Chart 3204*) is the northern extremity of Haitan Island. The point is 115 feet high, and is the termination of a ridge attaining a height of 436 feet in a summit about $1\frac{3}{4}$ miles southwestward of Saiang Point.

Tan Head is the eastern extremity of Haitan Island, and is about $8\frac{1}{4}$ miles southeastward of Saiang Point. The southeastern side of the headland rises steeply from the sea. Tan Point is the northeastern extremity of the headland, and consists of a low cliff within which is a hummock. A shoal, with a rock 8 feet high on it, extends about $\frac{1}{4}$ mile eastward from Tan Point; a rock, with a depth of less than 6 feet over it, lies about $\frac{1}{2}$ mile south-southeastward of the point.

The land for about $3\frac{1}{2}$ miles within Tan Point is low, and then rises to Kiun Shan, a ridge with its highest peak, Mount Pirie, about $4\frac{1}{2}$ miles northwestward of Tan Point. Mount Pirie is 1,448 feet high. The land between this ridge and the ridge of which Saiang Point is the seaward extremity is low.

Off-lying islands and dangers.—Tan Rocks, one of which dries 10 feet and another 15 feet, lie in a compact group about 1 mile eastward of Tan Point.

Dawson Rock, a pinnacle over which the depth is 4 fathoms, lies about $2\frac{1}{4}$ miles east-northeastward of Tan Point.

Kwing Island (Hulu Tao) is the largest island lying off the northeastern shore of Haitan Island. It is nearly 2 miles long in an east and west direction, and is about $1\frac{1}{2}$ miles wide. The island lies with its southwestern extremity about $1\frac{1}{4}$ miles northward of Tan Point. Sharp Peak, near the southeastern shore of the island, is 446 feet high. A rock drying 10 feet lies about $\frac{1}{2}$ mile east-southeastward of Sharp Peak. A drying reef lies about $\frac{1}{2}$ mile off the eastern shore of Kwing Island, and a rock drying 9 feet lies close off the northeastern extremity of the island.

Parry Islet, 257 feet high, lies westward of Kwing Island. The intervening channel is about $\frac{1}{2}$ mile wide, but is obstructed by reefs and fishing stakes. This is also true of the channel between Kwing

Island and Haitan Island. The tidal currents in both channels are strong; passage through them should not be attempted.

Vereker Rocks, two pinnacles close together, lie about 2 miles northeastward of Sharp Peak on Kwing Island. The western rock has over it a depth of $2\frac{1}{4}$ fathoms, and the eastern rock has over it a depth of $3\frac{1}{4}$ fathoms.

Channel Rock is a small islet lying about $1\frac{1}{2}$ miles northwestward of the northwestern extremity of Kwing Island. A rock drying 13 feet lies about 600 yards south-southeastward of the islet, and a rock drying 20 feet lies about the same distance northwestward.

A reef extends about 1,200 yards in a northerly direction from a point on the northeastern shore of Haitan Island in a position about 5 miles northwestward of Tan Point. A group of rocks drying 6 feet lies about 1 mile northward of the same point. A rock over which the depth is 20 feet lies about $\frac{1}{2}$ mile northeastward of this point. A shoal with a least depth of $2\frac{3}{4}$ fathoms was reported (1922) about $1\frac{1}{2}$ miles northward of this point.

The two Cust Islands lie within a distance of $1\frac{1}{4}$ miles southeastward of Saiang Point. The southeastern and larger island is 170 feet high; the smaller island is 97 feet high.

The Triplet Rocks, a group centered nearly $1\frac{3}{4}$ miles east-northeastward of Saiang Point, are three rocks of which the highest is 134 feet high. There is no safe passage between Triplet Rocks and the shore of Haitan Island.

Eastern side of Haitan Island.—Hai Head ($25^{\circ}28' N.$, $119^{\circ}51' E.$, *H. O. Chart 3204*) is the southern portion of a promontory lying about 5 miles south-southwestward of Tan Head. Hai Head attains a height of 202 feet. D'Arcy Hill, nearly $1\frac{1}{2}$ miles north-northwestward of the head, is 242 feet high.

Haitan Bay is an extensive indentation in the shore of Haitan Island between Tan Head and the promontory of which Hai Head is the southern portion. The bay has been only partially examined; there are numerous rocks and islets in it. One islet is 100 feet high. Bown Rock, drying 6 feet, is a steep-to pinnacle lying about $1\frac{1}{4}$ miles southeastward of the northern point of the entrance to the bay.

Off-lying islands and dangers.—The Lochinvar Islets consist of three islets and a number of reefs and rocks. The largest islet is 103 feet high, and lies with its southwestern extremity about 1 mile northeastward of the northeastern extremity of Hai Head. The channel between the shore of Haitan Island and Lochinvar Islets is unsafe. There are tide races for about $\frac{3}{4}$ mile eastward of the Lochinvar Islets.

Beal Rock, with a least depth of $1\frac{3}{4}$ fathoms, lies about $\frac{3}{4}$ mile east-northeastward of the northern extremity of the largest of the Lochinvar Islets.

Chinsu Islet lies near the eastern extremity of a drying reef extending about $\frac{1}{2}$ mile eastward from Hai Head. Chinsu Islet is 60 feet high in its southwestern portion. There are several other islets between Chinsu Islet and Hai Head. A 5-fathom patch lies about 550 yards southeastward of the southern extremity of Chinsu Islet.

Southeastern side of Haitan Island.—Haitan Point, the southern extremity of Haitan Island, lies nearly 6 miles southwestward of Hai Head. Rambler Bay lies on the northern side of the promontory of which Haitan Point is the southeastern extremity. On the northeastern side of the bay are Trite Island (for principal description see p. 461) and Vereker Island. The latter island, 237 feet high, lies about $2\frac{1}{2}$ miles west-southwestward of Hai Head. An islet, 101 feet high, lies between Vereker Island and the shore of Haitan Bay to the northwestward. A rock lies about 300 yards southward of this islet. There are rocks above and below water in the southern part of the bay.

Dwarf Anchorage ($25^{\circ}28' N.$, $119^{\circ}50' E.$, plan on *H. O. Chart 3205*).—Dwarf Anchorage is a partially sheltered area lying westward of the promontory of which Hai Head is the southern extremity.

Dwarf Point is the southwestern extremity of Hai Head, and is the eastern point of the entrance to the anchorage. A rocky patch, with a depth of 1 fathom, lies about 1,250 yards west-southwestward of Dwarf Point. A reef drying 10 feet lies about 500 yards northwestward of the point, and fishing stakes extend 800 yards southwestward from this reef. Camfield Point is about 700 yards northwestward of Dwarf Point. A rock, 15 feet high, lies about 200 yards southward of Camfield Point on the western end of a reef.

Anchorage.—Vessels unable to proceed against the northeast monsoon frequently lay over in Dwarf Anchorage. With this monsoon, however, a heavy swell sets in, particularly at certain stages of the tide, and vessels roll heavily. The holding ground is good.

The recommended position is with Turnabout Island Lighthouse (p. 469) bearing 106° and just open southward of Dwarf Point, and with Camfield Point bearing 7° . Here the depth is $5\frac{1}{4}$ fathoms.

Small vessels can anchor westward of Camfield Point, with Dwarf Point bearing 114° , in a depth of $3\frac{1}{2}$ fathoms; the bottom here is sand.

A British naval vessel rode out a strong north-northeasterly gale in a position about 1,100 yards westward of Dwarf Point. This vessel was, however, inconvenienced by the swell setting around Dwarf Point from about $2\frac{1}{2}$ hours to $\frac{1}{2}$ hour before high water.

ISLANDS AND DANGERS OFF HAITAN ISLAND (*B. A. Chart 1761*).—The largest island eastward of Haitan Island is Turnabout Island.

Several shoals have been reported from time to time some distance off Turnabout Island.

Turnabout Island ($25^{\circ}26' N.$, $119^{\circ}56' E.$, *H. O. Chart 3204*).—This island lies about 5 miles east-southeastward of Hai Head. It is about $\frac{1}{2}$ mile long in a north-northeast and south-southwest direction and about 600 yards wide. It attains a height of 218 feet. **Turnabout Island Light** (see Light List) is shown from a black circular tower, 54 feet high, on the summit of the island. The fog signal is a gun.

Lighthouse, bearing 299° .



Turnabout Island distant $2\frac{1}{2}$ miles.

Two small islets, one 18 feet high, lie close off the southern shore of Turnabout Island. A rock awash lies about 300 yards southward of the island. A rock, over which the depth is less than 6 feet, lies about 400 yards west-northwestward of the southwestern extremity of the island. Sunda Rock lies northward of Turnabout Island; the intervening channel is about 700 yards wide, and is obstructed by foul ground. Sunda Rock dries 3 feet.

Vessels should not approach Turnabout Island closer than $\frac{3}{4}$ mile. Several vessels have narrowly escaped being wrecked by rounding the southern end of the island too closely.

Haitan Shoal lies in the channel between Turnabout Island and Haitan Island in a position about 2 miles westward of the former island. The least depth over Haitan Shoal is 6 feet. At low water there are heavy tide rips over it, and the water is markedly discolored.

Shoals and dangers off Turnabout Island.—A rock, the position of which is approximate and which has not been examined, was reported (1939) about 2 miles north-northwestward of Turnabout Island. It is possible that this is the same rock which a vessel struck in 1875; this rock was searched for unsuccessfully in 1877.

In 1929 a sounding of 11 fathoms was obtained in a position about $5\frac{1}{4}$ miles southeastward of Turnabout Island; soundings of 15 fathoms were obtained $3\frac{1}{2}$ and $4\frac{1}{4}$ miles northeastward and north-northeastward, respectively, of this position. A British naval vessel confirmed the sounding in the latter position. A depth of 15 fathoms was also obtained $7\frac{1}{2}$ miles southwestward of the 11-fathom position, with a depth of 12 fathoms in the intervening area. In each case the bottom was sand.

A depth of 12 fathoms was reported (1908) about 7 miles southward of Turnabout Island.

Tidal currents.—Between Turnabout Island and the Ockseu Islands (p. 477), about 37 miles southwestward, the tidal currents set eastward and westward with a maximum rate of 3 knots. The direction of the currents is greatly influenced by the wind.

Outlying shoals.—Depths of 12, 10, and 14 fathoms have been obtained 22 miles, 27 miles, and 29 miles, respectively, eastward of Turnabout Island.

A United States naval vessel reported (1923) a depth of 5 fathoms in a position about 46½ miles northeastward of Turnabout Island. This shoal has not been examined. Depths of 15 to 25 fathoms were reported (1930) about 15 miles northward of this position.

APPROACHES TO HINGHWA SOUND (*B. A. Chart 1761*).—The entrance to Hinghwa Sound is fronted by an archipelago, the Eighteen Yits, and other islets and dangers.

Lam Yit Channel and Hinghwa Channel are the only practical routes into the sound. Lam Yit Channel lies between the mainland to the westward and the archipelago to the eastward. Hinghwa Channel trends along the northern side of the archipelago.

LAM YIT CHANNEL is entered from the southward between Loutz Rock and a detached sandbank southward of the southwestern extremity of Lam Yit.

Loutz Rock (*25°08' N., 119°23' E., B. A. Chart 1761*) has a peaked summit 20 feet high. A rock uncovering at half tide lies about 600 yards north-northwestward of Loutz Rock, and a similar rock lies about ¾ mile southward of Loutz Rock. Loutz Island is about 70 feet high, and lies about 1½ miles southwestward of Loutz Rock. A rock awash was reported (1903) about ½ mile westward of the island, but the position is doubtful. A vessel reported (1904) grounding on a shoal about 1½ miles south-southeastward of Loutz Island. Loutz Shoal consists of two sunken rocks about ¼ mile apart lying about 1½ miles west-northwestward of Loutz Island. Other dangers may exist in the vicinity.

Lam Yit, the largest island of the Eighteen Yits Archipelago, is about 7 miles long in a northwest and southeast direction, and is about 3 miles wide. The island lies with its southern extremity, a bold tableland 530 feet high, about 7¼ miles east-northeastward of Loutz Rock. High Cone, 565 feet high, lies on a peninsula forming the eastern extremity, and is the highest peak on the island. Low cone lies in the northwestern part of the island; Lam Point is the northwestern extremity of Lam Yit. South Yit is an islet connected to the southern extremity of Lam Yit by a drying reef. A rock awash lies about ½ mile eastward of South Yit. A flat rock above water lies about 2

miles northwestward of the islet and about ¼ mile off the southwestern shore of Lam Yit; about 800 yards southward of this rock is a rock awash. Duke Reef lies about 2 miles west-northwestward of South Yit, and dries about 23 feet; if there is any sea it breaks on Duke Reef at low water.

A large sandbank, with its southern extremity about 2 miles westward of Duke Reef, lies southward of the southwestern extremity of Lam Yit. This sandbank is subject to change; it is marked by discolored water. A 4½-fathom patch lies about 2¼ miles southward of the southwestern extremity of Lam Yit. The sandbank is the eastern point of the entrance to Lam Yit Channel. The eastern side of the channel is formed principally by the western side of Lam Yit.

Coast.—Ping Point lies about 6 miles northwestward of Loutz Island. The town of Pinghai lies close northward of the point. About 4 miles westward of the point is a high range of hills with a conspicuous peak, Marlin Spike. Ping Rock, 90 feet high and conical, lies nearly ½ mile southward of Ping Point. A rock awash lies about ¼ mile southwestward of Ping Rock; two rocks, each drying 1 foot, lie 150 yards and 350 yards, respectively, west-northwestward of Ping Point.

The coast between Ping Point and Fort Hill Point, nearly 8 miles northeastward, is fringed by rocks. This section is indented by a bay with rocks and foul ground in the middle of the entrance. The depths over a sandbank extending as far as 5 miles off the coast between Ping Point and Fort Hill Point are less than 5 fathoms; the eastern edge of this bank forms the western side of Lam Yit Channel.

Clam Islet is on the western side of the entrance to Lam Yit Channel from the northward in a position about 2¼ miles northwestward of Lam Point. Haystack Rock and numerous other rocks lie close westward of Clam Islet. A small islet lies about 1¼ miles northward of Clam Islet. A rock, over which the depth is about 6 feet, lies about 1¼ miles west-southwestward of the islet. A rocky patch, with a least depth of 1¼ fathoms, lies nearly 2 miles west-southwestward of Clam Islet. Shoal water was reported (1928) to extend about ½ mile southward from this patch.

Anchorage in Lam Yit Channel.—Vessels with local knowledge can obtain sheltered anchorage southward of Lam Point. The recommended position is as close to the point as a vessel's draft will permit. The outer rock off Lam Point always shows, and this rock must not be brought to bear more than 339°, as the depths in a bay entered southward of Lam Point decrease abruptly. Vessels must guard against a sunken rock about 1,200 yards south-southeastward of Lam Point. This anchorage is unsafe with strong northeasterly winds because of poor holding ground, consisting of rock covered with mud.

Anchorage can also be obtained, in depths of 4 to 5 fathoms, in a position about $1\frac{1}{2}$ miles northward of Lam Point.

Directions.—Vessels should proceed through Lam Yit Channel on a northerly course, and should pass about 1 mile westward of Lam Point, and about the same distance eastward of Clam Islet and the islet about $1\frac{1}{4}$ miles northward of Clam Islet.

HINGHWA CHANNEL (*B. A. Chart 1761*) has on its northern side numerous islets and dangers lying off the mainland westward of Vangan Point. The southwestern and southern side of the channel is formed by islands of the Eighteen Yits Archipelago lying northward and northeastward of Lam Yit.

South Entrance (p. 461), leading to Haitan Strait, branches off northward from Hinghwa Channel. Sedan Rock, Comet Rock, Sentry Island, Sand Island, Volga Rock, and Douglas Islet on the northeastern side of Hinghwa Channel, are described with South Entrance. Scattered Yits, Double Yit, and Hongkong Rock, on the southwestern side of Hinghwa Channel, also are described with South Entrance.

The islands and islets of the Eighteen Yits Archipelago lying northward and northeastward of Lam Yit are small, and cover a wide area encumbered by rocks, shoals, and reefs. The tidal currents are strong and variable, and the area is dangerous to navigation.

Triangle Yit ($25^{\circ}12' N.$, $119^{\circ}36' E.$, *H. O. Chart 3204*) lies about $1\frac{1}{4}$ miles southeastward of the eastern extremity of Lam Yit. Foul ground extends about 1 mile eastward from Triangle Yit. Fishing stakes may be found at times extending as far as 4 miles southeastward from a position about 2 miles east-southeastward of the islet. Cap Yit lies about $3\frac{1}{2}$ miles northeastward of Triangle Yit, and is 225 feet high. A drying rock lies less than $\frac{3}{4}$ mile eastward of Cap Yit; there are other rocks in the intervening channel.

Long Yit, an islet 173 feet high and steep-to at its western end, lies nearly $1\frac{1}{2}$ miles westward of Double Yit on the southwestern side of Hinghwa Channel. Northeast Yit Rock, about 10 feet high, lies nearly 2 miles northwestward of Long Yit. Shoal water extends about 200 yards northwestward from the rock. Little Yit Rock, about $1\frac{1}{4}$ miles westward of Northeast Yit Rock, is 20 feet high. In the channel between the two rocks are several patches with depths of $4\frac{1}{2}$ to $5\frac{1}{2}$ fathoms.

Punchard Islet, 64 feet high, lies about 400 yards off the mainland on the northern side of Hinghwa Channel in a position about $\frac{3}{4}$ mile westward of Vangan Point. A small islet lies close southwestward of Punchard Islet. Kerr Islet, 131 feet high, lies nearly 1 mile west-southwestward of Punchard Islet, at the northwestern extremity of a large patch of reef and foul ground with a least depth of 1 fathom. South Kerr Islet, 54 feet high, lies on this patch in a position about

600 yards southeastward of Kerr Islet. A reef with a least depth of 3 fathoms lies about $\frac{3}{4}$ mile southeastward of South Kerr Islet; a rock drying 8 feet lies about 700 yards south-southwestward of the islet. A shoal with a least depth of 7 fathoms lies nearly $1\frac{1}{4}$ miles southward of South Kerr Islet.

White Islet ($25^{\circ}19' N.$, $119^{\circ}33' E.$, *H. O. Chart 3205*), 130 feet high and bare, lies in the middle of Hinghwa Channel in a position about $2\frac{1}{4}$ miles west-southwestward of Kerr Islet. Hung Rocks, about 1 mile southward of White Islet, consists of an eastern portion, on which is a rock drying 8 feet, and a western portion on which is a rock drying 4 feet. The summit of Chim Island bearing 68° , and in range with South Kerr Islet, leads northward of Hung Rocks; Cliff Islet (p. 475) bearing 266° , and open northward of Red Yit, leads southward of Hung Rocks.

Red Yit lies on the southern side of Hinghwa Channel with its northern extremity about $3\frac{1}{4}$ miles southwestward of White Islet. The island is nearly 1 mile in diameter, and attains a height of 324 feet in its northern part. The area southward of a line joining the northern extremity of Red Yit and Little Yit Rock is foul. North Yit Rocks lie about $\frac{3}{4}$ mile north-northwestward of the northern extremity of Red Yit. A rock near the western end of the group dries 13 feet, and two rocks near the eastern end dry 2 feet and 4 feet, respectively.

The Passage Islands lie northwestward of Red Yit on the southern side of Hinghwa Channel. There are three islands in the group, with numerous rocks above and below water. Gough Islet, the northernmost of the group, lies about 4 miles westward of White Islet, and is conical and cliffy; it attains a height of 95 feet. Its northern side is steep-to. A rock, 1 foot high, lies about $\frac{3}{4}$ mile southeastward of Gough Islet; a shoal with depths less than 5 fathoms extends about $\frac{1}{2}$ mile eastward and about 800 yards westward from this rock. A reef drying 13 feet at its outer end extends about 400 yards westward from the westernmost of the Passage Islands.

Wilshere Island lies on the northern side of Hinghwa Channel in a position about $\frac{3}{4}$ mile north-northwestward of Gough Islet. Wilshere Island attains a height of 86 feet in its western part. A rock, 3 feet high, lies about 200 yards southward of the island. About 200 yards northwestward of the 3-foot rock is a rock drying 13 feet. A rock drying 12 feet lies about 400 yards northeastward of Wilshere Island.

Rugged Island, about $1\frac{1}{4}$ miles in length and width, lies with its southeastern extremity about $\frac{1}{2}$ mile north-northeastward of Wilshere Island. A summit in about the center of the island is 350 feet high. Griffith Islet lies about 800 yards off the northwestern shore of Rugged

Island. A rock with a depth of less than 6 feet lies about 800 yards west-northwestward of the southwestern extremity of Rugged Island.

Anchorage in Hinghwa Channel.—There is good anchorage during the northeast monsoon about midway between Kerr Islet and Douglas Islet. The depth in a position with Punchard Islet bearing 351° , and 1,200 yards distant, is 5 fathoms. The bottom in this locality is very uneven.

Anchorage may be obtained about 400 yards westward of Wilshere Island, in a depth of 12 fathoms, mud, out of the strength of the tidal currents. In 1936 a British naval vessel anchored with the western extremity of Wilshere Island bearing 81° , distant 1,400 yards, in a depth of 14 fathoms. The bottom near here is uneven, and the tidal currents are strong.

Tides.—The mean high water interval at Kerr Islet is 11h. 10m.; the mean range is 18 feet, and the spring range is 24 feet.

Tidal currents.—A portion of the northwest-going tidal current entering Haitan Strait by way of Southeast Entrance during the rising tide turns southwestward around Chim Island. This branch current divides southward of Volga Rock, one part flowing southward and the other part flowing through the numerous channels between Rugged Island and Lam Yit to Lam Yit Channel.

The west-going current in the channels between Rugged Island and Red Yit may attain a rate of 5 to 7 knots at spring tides, and sets fairly through the channels. Heavy overfalls and eddies are numerous. In March an eddy has been observed setting northeastward and southwestward between Red Yit and North Yit Rocks with a maximum rate of 2 to 3 knots.

Directions.—Vessels can enter Hinghwa Channel from the eastward by passing between Sedan Rock and Comet Rock, or between Sedan Rock and Scattered Yits. The channel then passes between Sentry Island and the rock reported to lie about $\frac{3}{4}$ mile east-northeastward of the largest of the Double Yit islets. Care must be taken to avoid the 3-fathom rock lying about 1 mile westward of Sentry Island.

The fairway then trends between Hongkong Rock, Northeast Yit Rock, and Little Yit Rock, on the southern side, and Volga Rock and South Kerr Islet, and adjacent dangers, on the northern side. White Islet bearing 280° , and kept midway between Wilshere Island and Rugged Island, leads clear of all dangers lying near South Kerr Islet. Note that vessels can pass either northward or southward of White Islet; the fairway then trends between Gough Islet and the rock 3 feet high off the southern side of Wilshere Island. The 3-foot rock must be given a good berth.

Vessels proceeding eastward through Hinghwa Channel from Lam Yit Channel should, after passing about 1 mile eastward of Clam

Islet (p. 471) and the islet $1\frac{1}{4}$ miles northward of Clam Islet, steer for the western extremity of Rugged Island. When Gough Islet bears 90° an east-northeasterly course can be steered to pass between Gough Islet and the 3-foot rock southward of Wilshere Island. White Islet can be passed on either side. White Islet should then be kept bearing 280° astern, and midway between Wilshere Island and Rugged Island, until the conspicuous patch of white sand (p. 460) on Haitan Island bears 27° . The directions for proceeding through Haitan Strait can then be followed.

Hinghwa Channel and South Entrance can be approached from the southwestward by passing about 400 yards westward of Triangle Yit, about 600 yards westward of Cap Yit, and the same distance westward of the Double Yit islets. The directions for proceeding through Hinghwa Channel can then be followed.

INNER PASSAGE BETWEEN LAM YIT CHANNEL AND HINGHWA CHANNEL (*B. A. Chart 1761*).—Lam Yit Channel and Hinghwa Channel unite at the entrance to Hinghwa Sound. An inner passage leading southward of the Passage Islands connects these channels. There are numerous dangers in this passage, and few marks for avoiding them, so that only small vessels should attempt it, and then only in cases of emergency.

Cliff Islet ($25^\circ 17' N.$, $119^\circ 28' E.$, *H. O. Chart 3205*) lies on the southeastern side of this passage in a position about $1\frac{1}{2}$ miles south-southwestward of the westernmost Passage Island. The islet is precipitous, and attains a height of 97 feet. A bank, with general depths of $3\frac{1}{2}$ to 5 fathoms, on the western side of the passage, lies with its eastern edge about 600 yards westward of Cliff Islet. On the southwestern edge of this bank, in a position about 1,700 yards westward of the islet, is a depth of $2\frac{1}{2}$ fathoms. A reef drying in two places near its outer end extends about 600 yards southeastward from Cliff Islet; a reef, part of which dries, lies within a distance of $\frac{1}{2}$ mile northeastward of the islet.

Douglas Rock, a small pinnacle over which the depth is 4 feet, lies about 1,300 yards south-southeastward of the easternmost Passage Island. A 2-fathom patch lies about 200 yards southeastward of Douglas Rock, and about 400 yards south-southeastward of the latter rock is another rock over which the depth is less than 6 feet. These three dangers lie on a rocky shoal, about 600 yards in diameter and with depths of $2\frac{3}{4}$ to 5 fathoms; Douglas Rock is at the northern extremity of the shoal. A reef, part of which dries, lies about $\frac{1}{2}$ mile southward of Douglas Rock.

Directions.—Vessels proceeding through this channel should pass about 300 yards westward of Cliff Islet by steering for the summit of Griffith Islet bearing 358° , and in range with the southwestern extremity of Rugged Island. This course should be held until the

northwestern side of Gough Islet bears 36° , and is in range with the southeastern side of the westernmost Passage Island, when the course should be changed to that heading. When the western side of the westernmost Passage Island bears 7° , and is in range with the western side of Wilshere Island, a course should be steered to pass midway between Douglas Rock and the rock, 1 foot high, lying about 700 yards north-northeastward of Douglas Rock.

HINGHWA (HUNGHWA) SOUND (*B. A. Chart 1761*) indents the mainland coast to a distance of about 16 miles, and is nearly 10 miles wide. The shores of the sound are irregular, and a peninsula terminating in Pitiu Point extends over 5 miles from the northern shore. There are many islets and dangers in Hinghwa Sound; the sound has not been thoroughly examined.

The Hinghwa River flows eastward into the western part of Hinghwa Sound.

Shores.—The northeastern point of the entrance to Hinghwa Sound is about 9 miles northeastward of Fort Hill Point, the southwestern entrance point.

Pirate Bay indents the southwestern shore of the sound, and is entered westward of a point about 7 miles west-northwestward of Fort Hill Point.

A conspicuous hill lies about 2 miles within the southwestern shore of the sound in a position about 12 miles west-northwestward of Fort Hill Point. Another conspicuous hill lies about $8\frac{1}{2}$ miles west-northwestward of the former hill.

The Hinghwa River is entered northeastward of the latter hill. A village, Hingwafu, is near the entrance.

Pitiu (Pitou) Point, the southern extremity of the peninsula extending from the northern shore of the sound, is about 10 miles north-northwestward of Fort Hill Point.

Islets and dangers in Hinghwa Sound.—Middle Islet ($25^\circ 17' N.$, $119^\circ 24' E.$, *B. A. Chart 1761*) lies in the entrance to Hinghwa Sound in a position about $1\frac{1}{2}$ miles northward of Clam Islet (p. 471). A rock awash is close southward of Middle Islet.

Knob Islet, with rocks northward and northwestward of it, lies about $4\frac{1}{2}$ miles northward of Clam Islet.

The Brothers, two islets in the southwestern part of the sound, lie about $6\frac{1}{2}$ miles west-northwestward of Knob Islet. A pyramidal stone **beacon** stands about $1\frac{1}{2}$ miles southeastward of the eastern Brother islet.

Pagoda Islet lies in the entrance to the Hinghwa River in a position about 5 miles west-northwestward of the western Brother islet.

A vessel struck a rock in 1931 in a position about $\frac{3}{4}$ mile southward of Pitiu Point. A rock, over which the least depth is 2 feet, lies $1\frac{1}{2}$ miles southward of the point.

Anchorage.—Hinghwa Sound affords anchorage in a typhoon. Vessels with local knowledge can secure good anchorage in a depth of 5 fathoms; the recommended position is with Pitiu Point bearing 66° .

This position can be approached by steering northwestward for the point from a position about $1\frac{1}{2}$ miles eastward of Knob Islet, and passing northeastward of the rocks lying northwestward of that islet.

Hinghwa River.—A vessel of moderate draft, and not longer than 250 feet, can proceed, with local knowledge, up the Hinghwa River at high water as far as Hingwafu. The vessel should moor abreast the village because of restricted swinging room.

A pilot is available.

COAST FROM HINGHWA SOUND TO CHUANCHOW HARBOR (*B. A. Chart 1761*).—The coast trends about 32 miles generally southwestward from Fort Hill Point to Pyramid Point. The latter point is close eastward of the northeastern point of the entrance to Chuanchow Harbor. This section of coast consists of extensive indentations separated one from another by rather narrow tongues of land. These indentations, in geographical order southwestward from Hinghwa Sound, are Pinghai Bay, Meichan Sound, and Port Matheson. Limited shelter or anchorage can be had in each of them.

The coast from Ping Point to Fort Hill Point has been described with Lam Yit Channel.

Pinghai Bay.—The entrance to this bay is about $6\frac{1}{2}$ miles between Ping Point (p. 471) and the Rowan Islands to the southwestward. The Rowan Islands lie close off a point on the coast.

Pinghai Bay is shoal in that part lying westward of the range marked by the conspicuous peak, Marlin Spike. The head of the bay is over 7 miles within the entrance.

Anchorage during the northeast monsoon can be taken by vessels with local knowledge westward of Ping Point. The depths off the town of Pinghai are 3 to 5 fathoms, but the holding ground is not good. With strong winds vessels often drag their anchors.

Off-lying islands.—The northwestern of the two Ockseu (Wukiu) Islands is about $14\frac{1}{2}$ miles southeastward of Ping Point, and is 237 feet high. The summit is round and has smooth sides. A large fishing village is on the southwestern side of the island. There are sandy hummocks on the southeastern island, which lies less than 1 mile from the other island and is about 150 feet high. Detached rocks lie off the southern side of the southeastern island.

Ockseu Islands Light (see Light List) is shown from a black circular tower, 64 feet high, on the summit of the northwestern island. The keeper's dwelling is white. The **fog signal** is a gun. Vessels

proceeding against the northeast monsoon in clear weather usually pass about $2\frac{1}{2}$ miles northwestward of the northwestern Ockseu Island.

Meichen Sound.—Shot Point ($25^{\circ}06' N.$, $119^{\circ}09' E.$, *B. A. Chart 1761*) is the northern extremity of Meichen Island, which lies in the entrance to Meichen Sound. Rogues Point, the southern extremity of the island, is nearly 5 miles west-southwestward of Shot Point, and is the northeastern point of the entrance to the sound.

The entrance to Meichen Sound is about 6 miles wide. The sound extends in a north-northwesterly direction for about 18 miles, and has been only partially examined.

There are numerous islets and dangers in Meichen Sound. A reef extends about 200 yards southeastward from Rogues Point. A 5-fathom patch and a $4\frac{3}{4}$ -fathom patch lie $1\frac{1}{2}$ mile southeastward and southward, respectively, of the point. Scout Rock lies about $1\frac{1}{4}$ miles westward of the point, and about $\frac{3}{4}$ mile farther westward is a large reef. Square Rock, with other rocks above water nearby, is on the southern end of this reef; Ninepin Rock is near the northern end of the reef. A group of flat rocks drying 17 feet lies about 1,200 yards eastward of Ninepin Rock; a drying rock lies about 1 mile north-northeastward of Ninepin Rock.

Saddle Island lies about 3 miles northwestward of Ninepin Rock. The island is surrounded by rocks and islets except on its northern side. A pinnacle rock over which the depth is 6 feet lies about $1\frac{1}{4}$ miles southwestward of the island in a position about $\frac{3}{4}$ mile northeastward of a point on the southwestern shore of Meichen Sound. Several rocks above water and a sunken rock lie about $1\frac{1}{2}$ miles eastward of Saddle Island. A rock drying 2 feet lies about $3\frac{1}{4}$ miles westward of Saddle Island.

Cliff Islet lies about 1 mile north-northeastward of Saddle Island; a rock awash is nearly midway between them. The depths are shoal as far as 1 mile westward from Cliff Islet. A large sand bank lies northwestward of the islet. A rock over which the depth is less than 6 feet lies about $1\frac{1}{4}$ miles southwestward of the southwestern extremity of Cliff Islet.

Mound Peak lies on the mainland in a position about 1 mile northward of Cliff Islet. A walled town, with a pagoda nearby, is close westward of Mound Peak.

Anchorage in the northeast monsoon can be obtained by vessels with local knowledge between Rogues Point and the flat rocks about 1,200 yards eastward of Ninepin Rock. Care must be taken to avoid Scout Rock. This is considered a good anchorage. Anchorage can also be taken in a depth of about 8 fathoms with Ninepin Rock bearing 180° and Rogues Point bearing 126° .

Good anchorage during the southwest monsoon can be obtained by vessels with local knowledge northwestward of Saddle Island.

Tides.—The mean high water interval in Meichen Sound is 0h. 20m.; the mean range is 13.8 feet, and the spring range is 17.0 feet.

Off-lying rock.—Sorrel Rock, about $3\frac{1}{2}$ miles east-northeastward of Rogues Point, is 60 feet high. A detached rock lies nearly 200 yards southward of Sorrel Rock. A shoal extends about 800 yards northeastward from Sorrel Rock.

Port Matheson.—Gulai Point ($24^{\circ}57' N.$, $119^{\circ}00' E.$, *H. O. Chart 3177*) is the northeastern point of the entrance to Port Matheson. Pyramid Point, the other entrance point, is about 4 miles south-southwestward of Gulai Point. Port Matheson indents the coast to a distance of about 5 miles.

Pyramid Point, a bold, black point 80 feet high, has a pyramidal shape when seen from the northward or southward. Pyramid Rock, southward of Pyramid Point, is connected to the latter by a drying reef. Pyramid Rock is about 60 feet high, and on its summit is a conical building 20 feet high. Rocks above and below water extend about 1,200 yards eastward and southeastward from Pyramid Point.

Sugarloaf Hill is the highest of several hills within the northern shore of Port Matheson. The hill is brown and conical, and is conspicuous from positions eastward of Pyramid Point. It is the only hill of that shape in the vicinity.

A group of islets, with several rocks around, lies in the southern part of the bay just within the entrance. The largest islet is 120 feet high. Another group of islets lies just within the entrance off the northern shore. The westernmost of these islets is 70 feet high. There are numerous other rocks, and vessels must proceed into the bay with caution.

Small vessels with local knowledge can secure good shelter from offshore winds in Port Matheson.

Coast.—A small bay entered westward of Pyramid Point affords anchorage to small vessels with local knowledge during the northeast monsoon. This anchorage is protected from the eastward by the reef connecting Pyramid Rock with Pyramid Point; this reef forms a good breakwater. Rocks lie with a distance of about 600 yards of a point about $1\frac{1}{4}$ miles westward of Pyramid Rock.

Tsungwu (Tongbu), a walled city, is situated on a point about $3\frac{1}{4}$ miles westward of Pyramid Point. Tsungwu Bay is entered westward of this point. **Tsungwu Light** (see Light List) is shown from a white cylindrical tower on the southwestern corner of the city wall.

Vessels with local knowledge can secure good shelter during the northeast monsoon in depths of 4 to 7 fathoms, but anchorage is not recommended because of numerous rocks off the shore of the bay.

Off-lying islands and dangers.—Juno Rock, consisting of a group

of rocky heads with a least depth of 2 fathoms, lies nearly 2 miles southwestward of Tsungwu. The depths around Juno Rock are 5 to 6 fathoms.

CHUANCHOW HARBOR (*H. O. Chart 2519*) is entered between the point on which Tsungwu is situated and a point, Siangchih Tsui, about 10 miles southwestward. There is little information about this harbor more recent than was obtained from the original survey in 1844.

Chuanchow Harbor is greatly obstructed by islands, banks, and reefs, and should be entered only by vessels with local knowledge. A heavy swell rolls in when there is any wind; the fairway into the harbor is dangerous at low water for vessels drawing more than 10 feet.

Shores—Islands.—Siangshih Tsui (Chungchi Point) is about 400 feet high. Sunken rocks extend about 600 yards southeastward from the point. Choho Point, on which is a pagoda, is about 4 miles northwestward of Siangshih Tsui. A shallow bay indents the southern shore of the harbor between these points. Tahin Rock, which dries, lies on the northern edge of a bank lying off this bay in a position nearly $1\frac{1}{4}$ miles northward of Siangshih Tsui. A sand bank extends $\frac{1}{2}$ mile northeastward and about $1\frac{1}{2}$ miles east-southeastward from Choho Point. A drying reef lies on the northern edge of this sand bank close northeastward of the point. Hewen Rocks lie between Tahin Rock and Choho Point.

Seatoi Island lies about $2\frac{1}{4}$ miles northward of Siangshih Tsui. The island attains a height of 40 feet at its eastern end, and is barren. Lynx Rock, over which the depth is 6 feet, lies about 600 yards east-southeastward of the eastern extremity of Seatoi Island.

The channel leading into the harbor lies northward of Tahin Rock and Hewen Rocks, and southward of Lynx Rock and Seatoi Island. Nearly in midchannel between Hewen Rocks and Seatoi Island is a reef with three drying rocky heads.

Pisai Islet lies about $1\frac{1}{2}$ miles northwestward of Choho Point. Ota Rock, which dries, lies about 900 yards eastward of Pisai Islet. A sand bank lies between the islet and the rock.

Tatoi Island lies about 1 mile northward of Seatoi Island, and attains a height of 358 feet. Seatoi Bank, with depths of 2 to 3 fathoms, lies about $1\frac{1}{4}$ miles southeastward of Tatoi Island; there are frequently overfalls on Seatoi Bank. Boot Sand occupies a large portion of the harbor westward of Tatoi Island.

Passage Island is about 50 feet high, and has a scorched appearance. It lies about $2\frac{3}{4}$ miles east-northeastward of Tatoi Island. A rock, with a depth of less than 6 feet over it, was reported (1939) about $1\frac{1}{2}$ miles southward of Passage Island. The position of this rock is approximate. Two rocks dry of several that lie within a distance of $\frac{1}{2}$ mile eastward of Passage Island. A ledge extends about 400 yards

southwestward from the island. A $3\frac{1}{4}$ -fathom patch lies about $\frac{3}{4}$ mile south-southwestward of Passage Island.

White Rocks, 20 feet high, lie north-northeastward of Passage Island. The intervening channel is about 800 yards wide and is obstructed by foul ground.

Takut Island, about $1\frac{1}{2}$ miles northward of Passage Island, is 200 feet high in its southeastern portion. Takut Island lies about $\frac{1}{2}$ mile off the northern shore of the harbor. A fort is on the southern extremity of the island. There is a large village on the island.

Wintau Point, on the northern shore of the harbor, is about $3\frac{3}{4}$ miles west-northwestward of Tatoi Island. A light (see Light List) is shown from a white circular tower on a square base on Wintau Point.

Anchorage.—Vessels with local knowledge can anchor in a depth of 7 fathoms between Choho Point and Boot Sand. This anchorage is reached by the narrow channel between Hewen Rocks and Seatoi Island. The depths in this vicinity were reported (1933) to be less than charted.

Vessels can also anchor northward of Boot Sand. This anchorage is approached by a channel about $\frac{3}{4}$ mile northward of Tatoi Island. The water northward of Boot Sand is smooth in all weathers.

Chuanchowfu (Tsinking) ($24^{\circ}54' N.$, $118^{\circ}35' E.$, *H. O. Chart 3177*) lies about 4 miles within the entrance to a river flowing into the head of Chuanchow Harbor. The town is on the northern bank. The entrance to the river is about 4 miles northwestward of Pisai Island. The channels leading to the town are shoal and intricate.

COAST.—Junk Head ($24^{\circ}41' N.$, $118^{\circ}42' E.$, *H. O. Chart 3177*) is about $6\frac{1}{2}$ miles southwestward of Siangchih Tsui. The intervening coast is indented by several small bays. Rocks and reef extend from the shores of these bays, and vessels without local knowledge should not enter.

Yungning Point lies about $1\frac{1}{4}$ miles southwestward of Junk Head.

Off-lying islet and rock.—Bell Islet lies about 2 miles south-southwestward of Siangchih Tsui, and is marked by a bell-shaped pagoda. The islet is not conspicuous. An obstruction was reported (1922) about $2\frac{1}{4}$ miles southward of Bell Islet.

Fairy Rock lies about 600 yards east-southeastward of Junk Head. The rock dries.

Shenhu (Chimmo) Bay ($24^{\circ}39' N.$, $118^{\circ}41' E.$, *H. O. Chart 2519*) indents the coast between Yungning Point and Shenhu Point, about $2\frac{3}{4}$ miles south-southwestward. The bay is unsafe during the southwest monsoon.

The shores of the bay are barren. Yungning, a walled town, lies just within Yungning Point. A flat islet about 15 feet high lies close off Yungning Point. A drying rock lies about 600 yards westward of the islet. Kusau Hill, 760 feet high and with a pagoda on its summit,

is conspicuous. The hill is within the northern shore of the bay in a position about $3\frac{3}{4}$ miles north-northwestward of Yungning Point. Close northeastward of Kusau Hill, separated from it by a deep gap or valley, is another hill of about the same elevation; the latter hill has two peaks. Shoulder Peak, about $6\frac{3}{4}$ miles northwestward of Yungning Point, is a useful mark.

A spit with a depth of $1\frac{1}{2}$ fathoms at its outer end, extends about $1\frac{1}{4}$ miles north-northeastward from Shenhu (Chimmo) Point. Pagoda Islet and Sour Islet lie on this spit. The southern of the two Chimmo Rocks, which lie close together and dry, lies about $\frac{1}{2}$ mile northward of Sour Islet. A 3-fathom patch lies about $1\frac{1}{2}$ miles northwestward of Sour Islet.

Shoulder Peak bearing 311° leads into Shenhu Bay between Chimmo Rocks and Yungning Point.

The coast (*H. O. Chart 3177*) between Shenhu Point and Huitau Point, about $8\frac{1}{2}$ miles southwestward, is generally low. Here and there are sand hills as high as 300 feet. No shelter can be had in any of the several small bays. Two walled towns lie on this section of coast; a small pagoda is near the southwestern town, which lies about $3\frac{1}{4}$ miles northeastward of Huitau Point.

Many dangers lie off this section of coast; it should be given a wide berth.

Tidal currents.—Between Shenhu Bay and Huitau Bay the tidal currents set northeastward and southwestward; the duration and rate of these currents vary with the monsoons. The direction of the currents is shown by the slant of the fishing nets moored off the coast.

HUITAU BAY (*H. O. Chart 1322*) lies between Quemoy Island and the mainland to the northward terminating eastward in Huitau Point. The entrance to the bay is about $6\frac{1}{2}$ miles wide between Dodd Head, the eastern extremity of Quemoy Island (for principal description see p. 485), and Huitau Point.

Vessels can secure good anchorage in Huitau Bay during the northeast monsoon.

Islands and dangers in the approach to Huitau Bay.—Dodd Island ($24^\circ 26' N.$, $118^\circ 30' E.$, *H. O. Chart 1322*) is on the southwestern side of the approach to Huitau Bay in a position about $6\frac{1}{4}$ miles south-southwestward of Huitau Point. The island is surrounded by reef that extends as far as $\frac{1}{4}$ mile in a northeasterly direction from the island. A $2\frac{1}{4}$ -fathom patch, on which the sea breaks occasionally, lies nearly $1\frac{1}{2}$ miles east-northeastward of the island. A reef drying 7 feet lies about $\frac{1}{2}$ mile northwestward of Dodd Island, and about 400 yards farther westward is a rock over which the depth is $1\frac{1}{4}$ fathoms. A reef, with a least depth of $1\frac{1}{4}$ fathoms, lies about $\frac{3}{4}$ mile northward of the island. This reef is marked by rollers when there is

any wind. **Dodd Island Light** (see Light List) is shown from a white circular tower, 79 feet high, on the summit of the island. The keeper's dwelling and adjacent buildings are also white. The **fog signal** is a gun. Dodd Island has been mistaken for Chapel Island (p. 501) on several occasions; note that Dodd Island Lighthouse is painted white, and that Chapel Island Lighthouse is painted black.

Dodd Passage is a navigable channel leading northeastward into Huitau Bay. The passage is nearly 2 miles wide between Dodd Island and Dodd Head, on Quemoy Island, to the northwestward; the fairway, between reefs on either side, has irregular depths of $4\frac{1}{2}$ to 9 fathoms. Dodd Head is fringed by numerous islets, rocks, and reefs. The easternmost reef dries 8 feet, and lies about $\frac{1}{2}$ mile offshore. A detached reef, with a least depth of $2\frac{1}{2}$ fathoms, lies about 800 yards south-southeastward of the southern extremity of the head. Matthews Islet and Liao lu Head are useful marks for proceeding through Dodd Passage. Matthews Islet is 40 feet high, and lies about $\frac{1}{4}$ mile off the southeastern shore of Quemoy Island in a position about $2\frac{1}{2}$ miles west-southwestward of Dodd Island. Liao lu Head, the southeastern extremity of Quemoy Island, is a peaked islet connected to the island by a reef. The islet is about $1\frac{3}{4}$ miles west-southwestward of Matthews Islet. Liao lu Hill, 779 feet high, lies about $3\frac{1}{4}$ miles northward of the islet.

Vessels proceeding northeastward into Huitau Bay by way of Dodd Passage should steer 9° for the eastern extremity of Dodd Head, taking care to be on that heading before Liao lu Head bears less than 280° . When Matthews Islet bears 224° course should be changed to 44° so as to keep Matthews Islet bearing 224° astern. This course leads through Dodd Passage in depths of 6 to 9 fathoms, but passes only about 400 yards southeastward of the $2\frac{1}{2}$ -fathom patch of reef lying south-southeastward of Dodd Head. Note that during April the tidal currents set northeastward and southwestward through Dodd Passage.

Shores of Huitau Bay.—Huitau Point ($24^\circ 31' N.$, $118^\circ 34' E.$, *H. O. Chart 1322*) is marked by Obelisk Hill. This hill is 30 feet high, and has on its summit an obelisk, 10 feet high and light-colored, that is not conspicuous. The obelisk resembles a chimney.

East Peak (Khikoe Soan) is 1,390 feet high, and lies about $13\frac{1}{2}$ miles northwestward of Huitau Point. West Peak (Ngchin Soan), 1,714 feet high, lies about $2\frac{1}{2}$ miles west-northwestward of East Peak. These peaks are useful marks.

Dodd Head is rocky. About $\frac{1}{2}$ mile within the extremity is a peak. Wall Point, on the northeastern side of Quemoy Island, is about 2 miles northward of Dodd Head. Eliza Bay is entered close southward of Chimney Point, which is near the northern extremity of the island. Eliza Islet lies close southeastward of Chimney Point on the northern

side of Eliza Bay. The northeastern shore of Quemoy Island is about $5\frac{1}{2}$ miles long between Dodd Head and Chimney Point.

Islets and dangers in Huitau Bay.—Reefs, on which the sea breaks heavily in bad weather, extend $\frac{1}{2}$ mile southward and westward from Huitau Point. A rock with a depth of $2\frac{3}{4}$ fathoms, with depths probably less in the vicinity, lies about $1\frac{1}{2}$ miles southeastward of the point. A vessel reported (1933) striking a rock in a position approximately 1,400 yards southeastward of Huitau Point; the depth over the rock is less than 6 feet.

Oyster Islet, a low, flat rock, lies about 2 miles north-northwestward of Huitau Point. Oyster Rock lies about 1 mile southward of Oyster Islet, and is awash.

Thalia Bank lies with its seaward end about $2\frac{1}{4}$ miles westward of Huitau Point. The depth on this end of the bank is $1\frac{3}{4}$ fathoms. The bank extends about 10 miles in a northwesterly direction to the head of Huitau Bay. Numerous rocks rise from Thalia Bank. White Rocks are a compact group about $3\frac{1}{2}$ miles within the seaward end of the bank. Flak Islet lies about $2\frac{1}{4}$ miles northwestward of White Rocks.

There is a deep channel off the southwestern side of Thalia Bank, and another off the northeastern side. The channel off the southwestern side of the bank is considerably encumbered by reefs, and should not be attempted by vessels without local knowledge. The channel off the northeastern side of the bank terminates in a creek trending in a northerly direction from the northern shore of the bay. Almost in the middle of the fairway through this channel, in a position about 2 miles east-southeastward of Flak Islet, is a $4\frac{1}{2}$ -fathom patch.

A ridge, with a depth of $3\frac{1}{2}$ fathoms at its outer end, extends about eastward across Huitau Bay from Wall Point, on Quemoy Island.

Anchorage.—During the northeast monsoon there is good anchorage about $\frac{1}{2}$ mile southwestward of Oyster Islet, in a depth of $3\frac{1}{2}$ fathoms. Anchorage can also be taken about $\frac{3}{4}$ mile westward of this islet. Vessels anchoring westward of the islet must be careful to avoid the southern end of a rocky ledge about 1,200 yards west-northwestward of the islet.

Anchorage can also be taken in a position with Flak Islet bearing about 241° , and about 1,800 yards distant.

Tides.—The mean high water interval in Huitau Bay is 0h. 05m.; the mean range is 13.2 feet, and the spring range is 16.2 feet.

Directions.—To reach the anchorage southwestward of Flak Islet a vessel should steer 0° for Oyster Islet. When the obelisk on Huitau Point bears 90° a course of 315° should be steered until Oyster Islet bears 90° . A course of 303° then leads to the anchorage, but passes close to the $4\frac{1}{2}$ -fathom patch about 2 miles east-southeastward of Flak Islet.

Vessels proceeding to the anchorage must take the tidal currents into consideration; note that the southwestern side of the navigable channel is steep-to, and that sounding gives no warning.

Directions for entering Huitau Bay by way of Dodd Passage are given on page 483.

AMOY HARBOR AND APPROACHES (*H. O. Chart 1322.*)—The northern side of the approach to Amoy Harbor is formed by Quemoy Island and Little Quemoy Island, off the southern sides of which are numerous shoals and spits. The southwestern side of the approach is formed by the mainland extending northwestward from Chinha Point. There are many islets and dangers in the approach to the harbor.

Amoy Outer Harbor is an area about 7 miles long. The entrance is about $\frac{3}{4}$ mile wide between two small islets, Tsing Seu and Chih Seu. Amoy Inner Harbor, northwestward of the Outer Harbor, lies between Amoy Island and Kulangsu Island, and also includes the northern part of the channel between Kulangsu Island and the mainland. Amoy Harbor is available to vessels of any draft at all times.

Quemoy Harbor is an area between Quemoy Island and Little Quemoy Island. The port affords shelter from all winds and is available in a typhoon.

THE QUEMOY ISLANDS AND QUEMOY HARBOR (*H. O. Chart 1322.*)—**Quemoy Island** is nearly 10 miles long in an east and west direction and is about 7 miles wide. The northeastern and southeastern shores of the island from Chimney Point to Liau lu Head are described with Huitau Bay (p. 483).

Liau lu Bay indents the southern shore of Quemoy Island between Liau lu Head and a point about $5\frac{1}{2}$ miles west-southwestward. The western part of the bay is foul; a bank, with depths of less than 3 fathoms, extends about 1 mile from the eastern shore of the bay. The outermost dangers consist of a $3\frac{1}{2}$ -fathom patch lying about $1\frac{1}{2}$ miles eastward of the western point of the entrance to the bay, and a $2\frac{1}{2}$ -fathom patch lying nearly $1\frac{1}{2}$ miles east-northeastward of the same point. A conspicuous rock, 49 feet high, lies about $\frac{1}{2}$ mile eastward of the point; another rock, 16 feet high, lies about 600 yards east-southeastward of the same point. Numerous rocks, some above water, lie around this point. Anchorage sheltered from winds between northwest and northeast, can be taken in the bay in a depth of $4\frac{3}{4}$ fathoms, over a bottom of mud and sand. The recommended position is with Liau lu Head bearing 95° and Liau lu Hill (p. 483) bearing 15° . Small vessels can anchor farther in the bay in a depth of $3\frac{3}{4}$ fathoms. When the northeast monsoon is at its maximum strength a heavy swell sets into Liau lu Bay, and anchorage is then impractical. South-

ward of Liau lu Head the tidal current sets westward during the rising tide and eastward during the falling tide.

Quemoy Pagoda ($24^{\circ}25' N.$, $118^{\circ}17' E.$, *H. O. Chart 1676*) is 39 feet high, and stands on a hill 176 feet high near Fort Point, the southwestern extremity of Quemoy Island.

Quemoy Bank, which terminates southward in Quemoy Spit, extends about 3 miles southward from Fort Point. The bank is from 400 to 1,200 yards wide between the 3-fathom curves; portions of it dry, as much as 9 feet in one place. The western edge of the bank is steep-to. A swell usually breaks on the bank, but at or near high tide it is not always marked when the water is smooth. A red whistle buoy, with "Quemoy" in white letters, is moored off the southern extremity of Quemoy Spit. Vessels should not pass between the buoy and Quemoy Island.

Spit Bank, with depths of 5 fathoms or less, continues about $1\frac{1}{2}$ miles southeastward from the extremity of Quemoy Spit. The least depth over the bank, $3\frac{3}{4}$ fathoms, lies about $3\frac{1}{2}$ miles southward of Fort Point.

Little Quemoy Island is about $3\frac{1}{2}$ miles long in a north-northeast and south-southwest direction and is about $2\frac{1}{4}$ miles wide. Its southeastern extremity is about 1 mile northwestward of Fort Point. The hilly northeastern portion of the island attains a height of 328 feet. The southwestern portion of the island consists of lower sand hills and cultivated areas. A flat with general depths of less than 3 fathoms extends as far as $1\frac{1}{4}$ miles off the southern shore of Little Quemoy Island. About 800 yards westward of the southwestern extremity of Little Quemoy Island is a group of drying rocks. An islet, 23 feet high, lies close off the northeastern extremity of Little Quemoy Island.

Phaktia Islet, 46 feet high, is close off the southern extremity of Little Quemoy Island; it is not noticeable against the island behind it.

Quemoy Harbor ($24^{\circ}26' N.$, $118^{\circ}17' E.$, *H. O. Chart 1676*) between Quemoy Island and Little Quemoy Island, affords complete shelter from the northward, and is available in a typhoon. The general depths are 6 to 11 fathoms in the fairway. The bottom in Port Quemoy is uneven; moreover, with southerly winds a swell sets in that makes anchorage uncomfortable.

A deep channel leading northward into Quemoy Harbor is over $\frac{1}{2}$ mile wide between the western side of Quemoy Bank and the eastern side of the flat extending off the southern shore of Little Quemoy Island. The channel connects northwestward and northward of Quemoy Island with Huitau Bay.

Middle Ground consists of a group of shoal patches lying in the middle of the harbor. The shoalest patch, with a depth of $2\frac{3}{4}$ fathoms, lies nearly $1\frac{1}{4}$ miles north-northeastward of Fort Point. A patch of $3\frac{1}{4}$ fathoms lies about the same distance northward of the point.

Middle Ground lies northeastward of a line drawn 117° from the 328-foot summit in the northeastern part of Little Quemoy Island.

The eastern portion of Quemoy Harbor is occupied by a partly drying flat, on which are drying boulders. The flat extends as far as $\frac{1}{2}$ mile from the western shore of Quemoy Island. The depths as far as 800 yards off the eastern shore of Little Quemoy Island are shoal.

A stone jetty extends from the eastern shore of Quemoy Harbor. The head of the jetty dries.

Directions.—Vessels approaching from the eastward should pass about 1 mile southward of the extremity of Spit Bank, and continue westward until a conspicuous summit southwestward of West Peak on the mainland within the northern shore of Huitau Bay bears $5\frac{1}{2}^{\circ}$, and is seen between the northeastern extremity of Little Quemoy Island and the 23-foot islet close off that extremity (see view on *H. O. Chart 1676*). Course should then be changed to $5\frac{1}{2}^{\circ}$ until Quemoy Pagoda bears 100° . A northeasterly course then leads into Quemoy Harbor.

Deep-draft vessels should not proceed farther into the harbor than positions with the 328-foot summit on Little Quemoy Island bearing less than 297° .

SOUTHWESTERN SIDE OF THE APPROACH TO AMOY HARBOR (*H. O. Chart 1322*).—Chinha Point is about 28 miles southwestward of Huitau Point. Pagoda Point is about $5\frac{1}{4}$ miles north-northwestward of Chinha Point; the intervening coast forms the southwestern side of the approach to Amoy Harbor. Amoy Outer Harbor is bounded to the southeastward by several islets that lie northeastward of Pagoda Point.

Coast.—The coast between Chinha Point ($24^{\circ}16' N.$, $118^{\circ}08' E.$, *H. O. Chart 1322*) and Pagoda Point consists of a number of rocky points with sandy bays between them. Nantai Pagoda is 60 feet high, and stands on the summit of a mountain, 1,352 feet high, about $2\frac{3}{4}$ miles southwestward of Pagoda Point.

Off-lying islands and dangers.—A spit with depths of less than 5 fathoms extends $\frac{1}{4}$ mile northeastward from Chinha Point. Banterer Reef, consisting of several drying rocks, rises from this spit. The depth in a position about $\frac{1}{4}$ mile southeastward of the extremity of the spit is $3\frac{1}{2}$ fathoms. This spit should be given a wide berth; the summit of Hwangkwa Islet bearing 353° , and in range with the eastern side of Wu Seu Island, leads about 600 yards eastward of this danger.

Dome Rock lies about 2 miles northward of Chinha Point and about 1,300 yards offshore. Dome Rock dries 10 feet. There is foul ground around the rock; a reef drying at its outer end extends about 1,200 yards from the mainland southwestward of Dome Rock.

Wu Seu Island lies with its southern extremity about 1 mile northward of Dome Rock. The island consists of a northern portion and a southern portion, both hilly, which are joined by a low, sandy isthmus. The northern portion is 206 feet high, and the southern portion is 222 feet high. On the eastern side of the isthmus is a small shallow bay with a sandy beach. There are also sandy beaches on the western shore of the island. A fishing village lies near the head of a bay indenting this shore. Wuan Islet, 192 feet high, lies about midway between Wu Seu Island and the mainland. Numerous rocks and reefs lie around Wuan Islet. The channels on either side of the islet are not recommended. The tidal currents through these channels are strong.

Chauchat Rocks are two rocks above water lying about 200 yards apart. The southeastern and higher rock is 9 feet high, and lies about 1,200 yards east-northeastward of the eastern extremity of Wu Seu Island. These dangers are covered by the red sector (302° – 000°) of the light on Tsing Seu Island. The channel between Chauchat Rocks and Wu Seu Island is clear and deep.

The Chin Tseao Rocks lie on a shallow bank about 1,200 yards in extent. The southern extremity of this bank is about 400 yards north-northwestward of the northern extremity of Wu Seu Island. The rocks consist of an islet 62 feet high, on which are a few shrubs, and several drying heads lying westward of the islet.

Outlying dangers.—Channel Shoals are two ridges of sand and shells about $\frac{1}{2}$ mile apart. The southeastern ridge has a least depth of 4 fathoms, and lies about 4 miles eastward of Chinha Point. The northwestern ridge has a least depth of $4\frac{3}{4}$ fathoms.

Westacott Shoals occupy an area, about $\frac{1}{2}$ mile in extent, lying about 7 miles east-northeastward of Chinha Point. The least depth over the area is $4\frac{3}{4}$ fathoms.

Islands and dangers in the entrance to Amoy Outer Harbor. Tsing Seu Island ($24^{\circ}22' N.$, $118^{\circ}17' E.$, *H. O. Chart 1322*) is the southwestern point of the entrance to Amoy Outer Harbor. The island lies about $1\frac{1}{2}$ miles east-northeastward of Pagoda Point. It is 168 feet high, and has a flat top with a slight depression in the middle. The southeastern side of the island is steep-to. A spit, over which the depth is $1\frac{1}{4}$ fathoms, extends about 400 yards from the northwestern side. A rock, almost awash, lies about 600 yards southwestward of Tsing Seu Island, and close northeastward of this rock is another over which the depth is $1\frac{1}{4}$ fathoms. A rock with a depth of $2\frac{3}{4}$ fathoms over it lies about 400 yards north-northwestward of the rock that is nearly awash. The outgoing tidal current sets strongly onto Tsing Seu Island. A **light** (see Light List) is shown from an octagonal tower, 33 feet high, on the northern slope of Tsing Seu Island. The

tower is painted in red and white vertical stripes; the keeper's dwelling and the boundary walls are painted white. The **fog signal** is a gun.

Three islets rise from a rocky bank on the northeastern side of the entrance to Outer Harbor. The southwesternmost islet, Chih Seu, is 55 feet high. The channel leading to Outer Harbor is nearly $\frac{3}{4}$ mile wide between Tsing Seu Island and Chih Seu Islet. Shoal water extends about 200 yards southwestward into the entrance channel from Chih Seu. A $4\frac{3}{4}$ -fathom patch lies about $\frac{1}{4}$ mile southward of the islet. A $1\frac{3}{4}$ -fathom patch lies about 400 yards east-southeastward of the islet. Tao Sao, the middle islet of the three, is 65 feet high, and lies about 600 yards northeastward of Chih Seu. Foul ground, including a rock drying 12 feet, extends about $\frac{1}{2}$ mile northwestward from Tao Sao. Hwangkwa Islet, the easternmost and largest of the three islets, is 111 feet high, and lies less than $\frac{1}{2}$ mile east-northeastward of Chih Seu Islet.

Seao Tan Island lies with its southern extremity about $\frac{1}{2}$ mile eastward of Hwangkwa Islet. Seao Tan Island is $\frac{1}{2}$ mile long in an east and west direction, and is over $\frac{1}{4}$ mile wide. It attains a height of 145 feet, and has on it the remains of some ancient forts.

Tai Tan Island consists of a southeastern portion, lying about $\frac{1}{2}$ mile northward of Seao Tan Island, and a northwestern portion connected to the southeastern portion by a low isthmus. The southern side of the southeastern portion is bold, and attains a height of 280 feet. The northwestern portion of the island is marked by a temple. **Tai Tan Island Light** (see Light List) is shown from a white iron hut, 10 feet high, on a summit in the southeastern portion. Seao Tan Island and Tai Tan Island lie on the southeastern end of a shoal flat extending northwestward from the islands to the southeastern side of Amoy Island (p. 491). The depths as far as $\frac{1}{2}$ mile southeastward from Seao Tan Island are less than 5 fathoms.

AMOY OUTER HARBOR (*H. O. Chart 1322*) extends in a general northwesterly direction about 7 miles from the entrance between Tsing Seu Island and Chih Seu Islet. Outer Harbor includes the southern part of the channel between Kulangsu Island and Sungseu Peninsula. Outer Harbor also includes that portion of the extensive estuary of the Pei Chi (North River) and Nan Chi (South River) lying eastward of Kiseu Island.

Access to Outer Harbor is easy; a pilot is not needed.

Anchorage are available, and the holding ground is good. The general depths in Outer Harbor are 7 to 16 fathoms.

Southwestern side of Outer Harbor.—The southwestern side of Outer Harbor is formed by the coast from Pagoda Point to a point, Ku ching sia, about $5\frac{1}{2}$ miles northwestward. The coast between Pagoda Point and Su abe (Titan Point), about $3\frac{1}{2}$ miles northwestward,

is indented by a bight nearly filled with drying flats. Kang Be Kang Creek trends through this bight. These flats continue seaward to form Taipan Shoal. The outer edge of this shoal trends southeastward from Su abe to a position about midway between Pagoda Point and Tsing Seu Island. The depths on Taipan Shoal are nearly everywhere less than 3 fathoms. The two Tsao Po islets, one 100 feet high, lie close together on Taipan Shoal about 1 mile west-northwestward of Pagoda Point.

The coast between Su abe and Ku ching sia, about 2½ miles west-northwestward, rises a short distance within to hills over 200 feet high. This section of coast is fringed by a drying bank of mud and sand from which rise boulders. Shoal water, with drying rocks, surrounds Su abe to a distance of about 400 yards.

Chinta Rock, over which the depth is 1¾ fathoms, lies about 800 yards offshore in a position about 1 mile northwestward of Su abe. A 3½-fathom patch lies about 200 yards eastward of this rock. About ¼ mile westward of the rock is the extremity of a bank, with depths of less than 5 fathoms, extending from the coast.

Western and northwestern sides of Outer Harbor.—Kiseu Island is in the western part of Outer Harbor in a position about 1¾ miles north-northwestward of Ku ching sia. The island attains a height of 198 feet. A shoal, with depths less than 3 fathoms, extends over ¾ mile eastward from Kiseu Island.

Sungseu Peninsula forms the northwestern portion of Outer Harbor. The peninsula has on its southern side the estuary formed by the confluence of the Pei Chi and the Nan Chi; on its northern side is an extensive bight nearly filled by drying flats. The peninsula is hilly. Kieng kau chem, 442 feet high, is the highest summit, and lies about 1¾ miles north-northeastward of Kiseu Island. Chingpi (*24°27' N., 118°02' E., H. O. Chart 1285*) is the southeastern extremity of the peninsula; the point rises to a hill, 273 feet high, with a yellow tower on its summit. Cass Spit extends about 800 yards southeastward from Chingpi, and has depths of less than 3 fathoms. Tiembuta (Minerva Rock) lies close off the outer extremity of Cass Spit in a position about 900 yards southeastward of Chingpi. The depth over Tiembuta is 6 feet. A black conical buoy, with "Minerva" in white letters on it, is moored about 250 yards southeastward of Tiembuta. Vessels must not pass between this buoy and Sungseu Peninsula. The buildings of a large oil company, including storage tanks, occupy the northeastern portion of the peninsula.

Northeastern side of Outer Harbor (*H. O. Chart 1322*).—The northeastern side of Outer Harbor is formed by the bank, with depths less than 3 fathoms, extending from Seao Tan Island and Tai Tan Island northwestward to Amoy Island. The latter lies with its southern extremity, Pechiah Thau, about 3 miles north-northwestward of

Seao Tan Island. The southwestern edge of the 3-fathom bank is about ¼ mile off Pechiah Thau, but off Cornwallis Stone, on the shore of Amoy Island in a position about 2½ miles west-northwestward of Pechiah Thau, the edge of the bank is only about 300 yards offshore. A conspicuous hangar, a gray building with a white roof, lies about ¼ mile west-northwestward of Pechiah Thau.

Amoy Island is over 8 miles long in a north and south direction and is about 6½ miles wide. It is divided into a northern and a southern portion by an extensive indentation nearly filled by a drying flat. The southern portion of the island is hilly. Kwang li tai Summit, 1,113 feet high, is the highest peak, and lies about 2½ miles north-northeastward of Pechiah Thau.

Cornwallis Stone (*24°26' N., 118°05' E., H. O. Chart 2157*) is a triangular rock 10 feet high and about 30 feet long at its base. Two radio masts about 200 yards northeastward of Cornwallis Stone are conspicuous. Stevens Rock, over which the depth is 19 feet, lies about 700 yards west-southwestward of Cornwallis Stone. A black buoy, surmounted by a black spherical cage top mark, is moored off the eastern side of the rock. Imperieuse Rock, over which the depth is 15 feet, lies about 100 yards westward of Stevens Rock. A rock, over which the depth is not known, was reported (1940) about 900 yards southward of Cornwallis Stone.

Kulangsu Island, which is separated from the southwestern shore of Amoy Island by the principal portion of Amoy Inner Harbor, has a length and width of about 1 mile. The island is picturesque and hilly; Joss Hill, the highest summit, is 287 feet high, and is in the southern part of the island. A flagstaff on the lookout station on Joss Hill is conspicuous from Outer Harbor. There are numerous large, dark boulders on the hills of Kulangsu Island. On the slopes are many houses of European architecture surrounded by trees. Wellington's Nose, a conspicuous boulder, stands on a hill, 107 feet high, in the northern part of Kulangsu Island.

The Bluff is the eastern extremity, 80 feet high, of Kulangsu Island; the point lies nearly 1 mile northwestward of Cornwallis Stone. Thumb Rock, 30 feet high, lies about 350 yards eastward of The Bluff. Seu intau (Beveridge Point) is the southern extremity of the island, and is about 800 yards southwestward of The Bluff. A shoal extends nearly ¾ mile southeastward from the southeastern shore of the island between The Bluff and Seu intau. The depths on the outer edge of the shoal are 5 fathoms, and the depths gradually decrease toward the shore of the island; the inner part of the shoal dries. Rugged Islet, 65 feet high, lies on this shoal in a position about 400 yards eastward of Seu intau. Intau Ridge, which dries, has on it a rock 15 feet high and a rock 6 feet high. The ridge lies about 250 yards southeastward of Rugged Islet.

Quarry Point (*H. O. Chart 1285*) is the western extremity of Kulangsu Island. It lies about $\frac{3}{4}$ mile west-northwestward of Seu intau. The shore between these points is fringed by flats drying in parts. Anson Bluff, 70 to 100 feet high, lies nearly midway between these points. A reef drying 10 feet extends about 100 yards southward from the southern extremity of Anson Bluff. Anson Spit is a narrow ridge with a least depth of $1\frac{3}{4}$ fathoms lying about 500 yards westward of Anson Bluff. A rock drying 15 feet lies about 200 yards southward of Quarry Point, and two drying rocks lie close together about 100 yards westward of the point.

Chiuaboi (Modeste Point) lies slightly more than $\frac{1}{2}$ mile north-northeastward of Quarry Point. The intervening shore is fringed by a drying flat with a steep-to outer edge. Chingsia is a group of rocks lying on this flat about 300 yards northward of Quarry Point. One rock of the group is 23 feet high. Several detached dangers lie close off the flat fringing the coast. Chiongkunta, a rock 1 foot high, with several drying rocks close around it, lies about 200 yards westward of Chiuaboi. A ridge with depths of $4\frac{1}{4}$ to $5\frac{3}{4}$ fathoms extends about 400 yards south-southwestward from Chiongkunta. The northeastern side of Kulangsu Island is described with Amoy Inner Harbor.

Storm signals.—A storm signal station is located on a hill, 176 feet high, about 250 yards westward of The Bluff. Storm signals according to the China Seas Storm Signal Code (p. 24) are displayed. Each vessel in the harbor must hoist the answering pennant when the signal displayed has been noted. When all vessels have hoisted this pennant the signal is hauled down.

Anchorage in Outer Harbor.—Anchorage is available in a typhoon about $1\frac{1}{2}$ miles westward of the light structure on Tai Tan Island.

There is anchorage in depths of 7 to 12 fathoms in the southern parts of the channel between Kulangsu Island and Sungseu Peninsula.

Anchorage can be obtained off the southern side of Kulangsu Island, in depths of 7 to 10 fathoms, within a distance of $\frac{1}{2}$ mile southwestward of Seu intau. A British naval vessel anchored in 1932 in a position with the signal station on The Bluff bearing 36° and 2,800 yards distant. Here the holding ground, of sand and mud, was good. Another British naval vessel in 1935 anchored with this signal station bearing 26° and $\frac{3}{4}$ mile distant. Here strong eddies were observed 1 hour before and after slack water during spring tides. Vessels anchored about 200 yards westward of this position were not affected.

Vessels can anchor off the southern entrance to the channel between Amoy Island and Kulangsu Island in a depth of $6\frac{1}{2}$ fathoms, over a bottom of mud. A suitable position is about 300 yards northward of Imperieuse Rock with Cornwallis Stone bearing 90° and Thumb Rock

bearing 326° . A vessel in this position is as close to the city of Amoy as is possible without mooring.

Prohibited anchorage.—Anchorage is prohibited, because of submarine cables, in an area south-southeastward of Kulangsu Island shown by dashed lines on *H. O. Chart 1285*.

Landing places.—In fine weather boats can land on the sandy beach on the western side of Seu intau. Permission to do so must be secured from the telegraph office nearby.

Boats can also land, at any state of the tide, northwestward of the telegraph office. The beach here is more exposed than the beach westward of Seu intau.

Tidal currents in Outer Harbor.—The tidal currents set northwestward during the rising tide and southeastward during the falling tide. The maximum rate at springs is 2 knots, except of Su abe, where faster rates may be experienced.

The tidal currents between Kulangsu Island and Sungseu Peninsula set northward during the rising tide and southward during the falling tide. The rate at springs is 2 to 3 knots, and at neaps 1 knot.

Directions for Outer Harbor.—Deep-draft vessels proceeding toward Outer Harbor from the southward should pass at least $\frac{1}{2}$ mile eastward of Chapel Island (p. 501), and thence eastward of Channel Shoals. When Tsing Seu Island is open northeastward of Wu Seu Island course should be shaped for Tai Tan Island. When Su abe bears about 304° , and is well open northeastward of Tsing Seu Island, vessels can steer for the entrance to Outer Harbor between Tsing Seu Island and Chih Seu Islet, passing northeastward of Chauchat Rocks. Note that Nantai Pagoda, a good mark, is often obscured by clouds during the southwest monsoon.

Vessels approaching Outer Harbor from the northward should pass at least 2 miles southeastward of Dodd Island to clear off-lying dangers. Liau'lu Head should not be approached closer than 1 mile; the vessel must not get into depths less than 6 fathoms. Deep-draft vessels must pass southward of the extremity of Spit Bank. The entrance to Outer Harbor can be steered for after passing Spit Bank.

AMOY INNER HARBOR (*H. O. Chart 1285*).—The limits of Inner Harbor, between Kulangsu Island and Amoy Island and the northern portion of the channel between Kulangsu Island and islands to the northwestward, are shown in dashed lines on *H. O. Chart 1285*. The principal portion, between Kulangsu Island and Amoy Island, is restricted by rocks and by banks extending from both shores. The bottom in this portion of the harbor is uneven. It is said that if anchor cables foul the rocks they can be recovered only with considerable difficulty.

Depths.—Vessels of any draft can proceed into Inner Harbor. The

length of a vessel is of more importance in anchoring or mooring than the draft. The largest vessel entering in 1937 drew 28 feet of water; the longest vessel was 510 feet long.

Vessels drawing up to 30 feet can use any of the mooring berths except the three "P" berths.

At high water vessels of any draft can proceed around Kulangsu Island.

Islets and dangers.—Coker Rock ($24^{\circ}26' N.$, $118^{\circ}04' E.$, *H. O. Chart 2157*) lies in the middle of the southern entrance to Inner Harbor in a position about 800 yards east-southeastward of Rugged Islet. Coker Rock is awash. A black and white checkered **buoy** is moored about 150 yards eastward of the rock, and a red and white checkered **buoy** is moored about the same distance westward of it. Chang Hock Kiang, a rock over which the depth is 14 feet, lies about 100 yards northwestward of Coker Rock.

Kaiser (Middle) Rock lies nearly 300 yards northward of Coker Rock, and has over it a depth of 14 feet. A black **buoy** is moored off the northeastern side of Kaiser Rock. Another rock, over which the depth is 28 feet, lies about 200 yards west-northwestward of Kaiser Rock.

Brown Rocks, consisting of three rocky heads lying close together, lie north-northwestward of Kaiser Rock. The southernmost, over which the depth is 7 feet, is about 400 yards eastward of The Bluff. The depths over the other two rocky heads are 13 and 14 feet, respectively. A red and white checkered **buoy**, with a black spherical-cage top mark, is moored off the southwestern side of Brown Rocks, and a similar **buoy**, painted in black and white checkers, is moored off the northeastern side.

Kau thau ta, a rock drying 9 feet, is close off the eastern shore of Kulangsu Island in a position about 750 yards north-northwestward of The Bluff. A **light** (see Light List) is shown from a granite obelisk, painted in black and white horizontal bands, on Kau thau ta.

Chiotah Rock lies on the western side of Inner Harbor in a position about 150 yards northeastward of Kau thautau. A **beacon**, consisting of a black granite obelisk, 17 feet high and surmounted by a white sphere, marks the rock. Chiotah Rock dries. Iltis Rock, over which the depth is 5 feet, lies about 100 yards southeastward of Chiotah Rock. Both rocks rise from a bank over which the least depth is 9 feet.

Therese Rock, over which the depth is 5 feet, lies close off the eastern shore of Inner Harbor in a position about 450 yards east-northeastward of Chiotah Rock.

Kang Sim Tak is a rocky reef drying 11 feet. It lies on the western side of Inner Harbor in a position about 300 yards northwestward of Chiotah Rock, and is marked by a **beacon** consisting of a black

granite obelisk, 15 feet high, standing on its northeastern part. There is a tide pole near the beacon. Chapman Rock lies about 300 yards northward of this beacon, and has over it a depth of 19 feet. Devonhurst Rock has over it a depth of 13 feet, and lies nearly 650 yards northwestward of the same beacon.

Alibi Rock lies about 300 yards northwestward of Devonhurst Rock, and is marked by a **beacon** consisting of a black granite obelisk 22 feet high. Alibi Rock dries. Harbor Rock lies about 300 yards northeastward of Alibi Rock, and has over it a depth of 9 feet. Harbor Rock is marked by a red and black checkered **buoy** moored off its northwestern side. A rocky patch, with a least depth of 28 feet, lies about 250 yards north-northwestward of Harbor Rock.

Ieboi Point is the northern extremity of Kulangsu Island. A drying flat extends about 400 yards north-northwestward from the point. The flat continues under water about 600 yards farther northward; Kellett Spit is the extremity of the flat. Isere Rocks are about midway between the extremity of the spit and Ieboi Point. A **buoy**, painted in red and black vertical stripes, is moored off the eastern side of Kellett Spit. Northeastward of Kellett Spit is a bank over which the depths are less than 30 feet. This bank extends from the eastern shore of Inner Harbor, and has on it Banner Rock, over which the depth is 6 feet, and some drying rocks.

Eight perches, each surmounted by a white sphere, mark rocks lying close off the western shore of Inner Harbor.

Hauseu (Monkey) Islet, 60 feet high, lies about $\frac{3}{4}$ mile north-northwestward of Ieboi Point. A ridge, with depths of 2 to 5 fathoms, extends nearly $\frac{1}{4}$ mile south-southwestward from the southern shore of Hauseu Islet.

The four Chalk Islets extend about $\frac{3}{4}$ mile in a north-northeast and south-southwest direction. The southernmost islet is 56 feet high, and lies about 1 mile northwestward of Hauseu Islet. The northernmost islet is 125 feet high. The lower parts of these islets are white.

Harbor lights.—Two lights, disposed vertically, are shown on a derrick near the outer extremity of a petroleum pier on the eastern shore of Inner Harbor east-northeastward of The Bluff.

A light is shown near the customhouse, which lies on the eastern shore of the harbor in the northern part.

Channels.—Vessels arriving during the south-going tidal current proceed into Inner Harbor by way of the southern entrance and the channel eastward of Kulangsu Island.

Vessels arriving during the north-going tidal current pass westward around Kulaugsu Island and enter Inner Harbor from the northward.

Anchorage.—Several areas available for anchoring in Inner

Harbor are shown on H. O. Chart 2157 by large letters enclosed in circles. Vessels must moor, using two anchors. A vessel is directed to an area by a signal flag, of the International Code, hoisted under the vessel's national flag or the house flag at the signal station on Kulangsu Island.

Large naval vessels usually anchor from 700 to 1,600 yards south-southwestward of Hauseu Islet. Vessels at single anchor are liable to drag, as the bottom is soft mud with patches of gravel.

In 1928 a British naval vessel found good holding ground in a position with the summit of Hauseu Islet bearing 23° , distant about 1,300 yards. Boats from this vessel landed without difficulty near a disused custom house on Chuiaboi.

Good anchorage can also be had between Hauseu Islet and the shore of Amoy Island to the southeastward.

A United States naval vessel in 1939 anchored about 300 yards northward of Alibi Rock in the "W" area of Inner Harbor. This vessel moored with 60 fathoms on one cable and 45 fathoms on the other. The holding ground was good. Boats landed at a ferry landing, about 1,700 yards from the vessel, near the British Consulate, which is in about the middle of the eastern shore of Kulangsu Island.

Mooring buoys.—Several mooring buoys in Inner Harbor, marked by small capital letters in parentheses, are shown on H. O. Chart 2157. Vessels are directed to one of these by a signal, consisting of the berth letter under the national or house flag, hoisted at the signal station. One mooring berth is available for a vessel up to 600 feet long. Two are available for vessels up to 500 feet long, and the remainder are for vessels 200 to 400 feet long.

Special anchorages.—The limits of an anchorage area for vessels laden with petroleum products are shown in dashed lines on H. O. Chart 2157.

The quarantine anchorage area lies southward of the petroleum products anchorage, as shown on the chart.

An area for vessels laden with mineral oil lies westward of Kulangsu Island, as shown in dashed lines on H. O. Chart 1285.

The area for vessels laden with explosives lies southward of the mineral oil anchorage area, as shown on the same chart.

Port signals.—The system of port signals in use at Amoy is described on page 41.

Port regulations.—Port regulations, printed in English, are available to vessels visiting Amoy.

Tides.—The mean high water interval in Inner Harbor is 0h. 02m.; the mean range is 12.4 feet, and the spring range is 15 feet.

The tides are considerably influenced by the force and duration of the wind.

Tidal currents.—The tidal currents in Inner Harbor set northward

and southward, each running for about $6\frac{1}{4}$ hours. The average rate of the north-going current is 2 to 3 knots at spring tides. The rate of the south-going current is about 3 knots during the first 3 hours. In the middle of the harbor the north-going current runs from $\frac{1}{4}$ hour before low water to $\frac{1}{4}$ hour after high water.

Pilotage.—A pilot is not considered necessary in proceeding through Outer Harbor. In the Inner Harbor pilotage is not compulsory but it is advisable. Pilots take charge of vessels near a line joining Cornwallis Stone and Su abe; they relinquish charge of a vessel outward bound near the same line.

Directions.—Vessels proceeding into Inner Harbor by way of the southern entrance against the south-going tidal current should pass eastward of the buoy marking Stevens Rock, and then between the shore of Amoy Island and the buoys off the eastern sides of Coker Rock, Kaiser Rock, and Brown Rocks. After passing Brown Rocks vessels can pass close eastward of all the dangers in the western part of the harbor by steering 324° for the southernmost Chalk Islet, with the islet just open northeastward of the northeastern side of Hauseu Islet. (See view B on H. O. Chart 1285.)

Vessels proceeding westward around Kulangsu Island so as to enter Inner Harbor from the northward against the north-going tidal current should pass southward of the shoal water extending southeastward of Kulangsu Island. A vessel should then pass between the western shore of that island and Sungseu Peninsula. Anson Spit, Chiongkunta, and the other dangers off the western shore of Kulangsu Island must be given a wide berth. Vessels should then pass northward and eastward of the buoy marking Kellett Spit. Caution must be exercised here as the directions of the tidal currents are uncertain about the times of high and low water; the south-going tidal current sets directly onto the buoy marking Kellett Spit. Vessels should pass at least 100 yards westward of the buoy marking Harbor Rock. The channel eastward of the rock is not safe. A course with the southernmost Chalk Islet bearing 324° astern, and just open northeastward of the northeastern side of Hauseu Islet, leads close eastward of the dangers in the western part of Inner Harbor.

Vessels leaving Inner Harbor during the south-going tidal current proceed through the northern entrance and westward around Kulangsu Island; those leaving during the north-going tidal current can proceed directly through the southern entrance. Note that with a north-going current there may be a strong easterly set in the southern entrance; this must be guarded against, especially by vessels using the channel westward of the Kaiser Rock, Coker Rock, and Stevens Rock. A westerly set may be experienced soon after the south-going current has commenced in Inner Harbor.

Vessels usually enter Inner Harbor during the daytime. Vessels sometimes leave Inner Harbor on a clear night with a pilot in charge.

It should be noted that it is difficult to turn around in Inner Harbor; it is not advisable to let go on an anchor to assist in turning, because of the danger of fouling buoy moorings.

AMOY ($24^{\circ}27' N.$, $118^{\circ}04' E.$, *H. O. Chart 2157*).—The city of Amoy occupies the southwestern part of Amoy Island. The foreign concessions and the principal mercantile establishments lie along the eastern shore of Inner Harbor. A considerable amount of land has been reclaimed in this section; a seawall has been erected. Amoy is an important port of embarkation of coolie labor.

Kulangsu Island is an international settlement. The residents manage their affairs according to regulations and bylaws drawn up by themselves, but subject to approval by the national government.

In 1939 the population of Amoy was about 40,000, and the population of Kulangsu Island was about 60,000.

The United States is represented by a consul.

Piers.—Four piers extend from the northeastern shore of Sungseu Peninsula. The northernmost is a stone landing pier. The southernmost is 400 feet long. A pier 600 feet long, above the 400-foot pier, has four mooring buoys off its head, and can accommodate a vessel drawing 30 feet and 550 feet long.

A small petroleum pier is on the eastern shore of Inner Harbor northeastward of Brown Rocks.

Two pontoons, each with a depth of 22 feet alongside, are moored off the eastern shore of Inner Harbor. Each pontoon is 210 feet long.

Repairs.—Repairs can be executed.

A government drydock lies on the eastern side of the northern entrance to Inner Harbor. For details of this drydock see appendix II.

A movable hand crane can lift up to 10 tons; another hand crane in the dockyard can lift up to 18 tons.

Supplies.—Ample quantities of coal can be obtained. Fuel oil is available in large quantities.

Fresh provisions are usually plentiful. An unlimited amount of boiler and drinking water can be supplied by water barge.

Limited quantities of engineers' and deck supplies are obtainable.

Communications.—There is frequent communication by steamer with Hong Kong, Shanghai, Foochow, and Taiwan.

Amoy is connected with the general telegraph and telephone systems. A radio station is open to public correspondence.

Amoy is connected by cable with Shanghai and Hong Kong.

Climate.—The climate is subtropical; the temperature ranges from $40^{\circ} F.$ in winter to $100^{\circ} F.$ in summer. The annual rainfall is about 48 inches. The summers are extremely humid.

Hospitals.—There is a quarantine hospital for communicable diseases, and two general hospitals. One of the latter, the Hope and Wilhelmina Hospital, has 110 beds, and will accept seamen.

CHAPTER VIII

AMOY TO HONG KONG APPROACH

COAST FROM AMOY OUTER HARBOR TO RED BAY (*H. O. Chart 3177*).—The coast trends southwestward about 19 miles from Chinha Point to Cork Point. The latter point is the northeastern extremity of a headland forming the northeastern side of Red Bay.

This section of coast is irregular. In one of the indentations, Tingtai Bay, small vessels can secure fair shelter. Temporary shelter can be obtained in the lee of Notch Islet, which lies close off this section.

The largest outlying island, Chapel Island, is a useful mark for vessels approaching Amoy Outer Harbor for the southward.

Coast.—Table Head ($24^{\circ}14' N.$, $118^{\circ}06' E.$, *H. O. Chart 1322*) lies about 3 miles southwestward of Chinha Point. The intervening coast forms a bight. Table Head is a prominent headland with a flat top. The ruins of a walled town lie on a hill about $1\frac{1}{2}$ miles northwestward of the headland.

Broken and discolored water was reported (1927) to extend for a considerable distance from the coast between Table Head and Chinha Point.

Tingtai Bay (*plan on H. O. Chart 3158*) lies westward of Table Head. A rocky patch, with a least depth of 2 fathoms, lies in the southwestern part of the bay in a position nearly 2 miles west-southwestward of Table Head.

Small vessels can secure fair shelter in Tingtai Bay during the northeast monsoon.

Coast.—House Hill lies on the coast in a position about $7\frac{1}{2}$ miles southwestward of Table Head. The hill is low; on its summit are the ruins of a house. House Hill Point is the southern extremity of a small islet connected to House Hill at low water. A shoal inlet, known locally as Chung Chou, extends some distance inland along the western side of House Hill. A sand bank, drying in places, extends across the entrance to the inlet. Two peaked sand hills, 300 to 400 feet high, lie about 1 mile northward of House Hill. A reef, on which are three drying patches of rock, extends nearly $\frac{3}{4}$ mile south-southwestward from House Hill Point. About $\frac{1}{2}$ mile off the coast in a position about 4 miles southwestward of House Hill is a group of rocks just above water.

Cork Point lies nearly 9 miles southwestward of House Hill. A reef extends about 800 yards eastward from Cork Point. Mount Edmond, 1,500 feet high, is about 6 miles northwestward of Cork Point, and is a good mark.

Red Bay (*plan on H. O. Chart 2599*) lies westward of the headland of which Cork Point is the northeastern extremity. The eastern entrance point is about 1 mile southwestward of Cork Point. Black Point, the western entrance point, is about 4 miles west-southwestward of the eastern entrance point, and is dark and rugged, with a table top. A mark for Black Point is a conspicuous peaked sand hill lying about $\frac{3}{4}$ mile westward of the point. The land behind Red Bay consists of low red sand hills. A creek, with a village on the western side of the entrance, flows into the bay through the northern shore. The entrance to this creek dries.

Black Rocks lie about $\frac{1}{2}$ mile southwestward of the northeastern point of the entrance to Red Bay. The two highest rocks are each 55 feet high. A drying reef extends about 500 yards northwestward from Black Rocks; between the reef and the shore of the bay is a boat channel. A drying reef lies about 1,200 yards northwestward of Black Rocks. Shun Rock, over which the depth is less than 6 feet, lies about 1,200 yards eastward of Black Point. The southern high rock of the Black Rocks group bearing about 56° , and in range with the northeastern point of the entrance to Red Bay, leads close southeastward of Shun Rock.

Fairly good anchorage can be secured by small vessels during the northeast monsoon in Red Bay. The northern part of the bay is shoal.

Off-lying islets and dangers.—Chapman Patch ($24^\circ 13' N.$, $118^\circ 03' E.$, *H. O. Chart 1322*) lies nearly $2\frac{3}{4}$ miles southwestward of Table Head and about 1 mile offshore. The general depths over this rocky patch are 2 fathoms; at the eastern end is a pinnacle rock over which the depth is 5 feet.

Notch Islet lies close offshore in a position about $2\frac{3}{4}$ miles northeastward of House Hill Point. The summit of the islet is 300 feet high, and is rather steep and square. The depths as far as $\frac{3}{4}$ mile eastward from the islet are less than 5 fathoms. Reefs extend as far as $\frac{1}{4}$ mile southward and $\frac{1}{2}$ mile northwestward from the islet. Temporary shelter can be obtained under the lee of Notch Islet during the northeast monsoon.

North Merope (Lingmunkao) is a reef, consisting of pinnacle rocks, lying about 3 miles eastward of Notch Islet. The highest rock dries 8 feet.

Lamtia Island lies about 3 miles southward of Notch Islet. Lamtia Island attains a height of 170 feet; its southern side is steep. A reef extends about $\frac{1}{2}$ mile northwestward from the islet.



Chapel Island.

Outlying island and dangers.—Chapel Island ($24^\circ 10' N.$, $118^\circ 14' E.$, *H. O. Chart 1322*) is nearly $8\frac{1}{2}$ miles southeastward of Chinha Point. The island has steep sides and a grassy top, 180 feet high. There is a remarkable mound at either end of the island; the southern end is perforated. **Chapel Island Light** (see Light List) is shown from a black circular tower, 63 feet high, on the summit of the island. The keeper's dwellings and the boundary wall are white. The **fog signal** is a gun.

In addition to the following shoals there are several patches with depths of 5 to 6 fathoms. Deep-draft vessels should always pass eastward of Chapel Island.

Rambler Shoal lies about 3 miles northwestward of Chapel Island. The general depths over this small patch are $4\frac{1}{4}$ fathoms.

Erl King Shoal is about 5 miles northwestward of Chapel Island. The least depth over this shoal is $2\frac{3}{4}$ fathoms.

South Merope, a shoal with a least depth of 5 feet, lies about $7\frac{1}{2}$ miles west-southwestward of Chapel Island and about the same distance offshore. The depths as far as 3 miles northeastward from the shoal are less than 5 fathoms. The depths between Chapel Island and the mainland are irregular.

Tidal currents.—The tidal current has been observed at Chapel Island in the southwest monsoon to set northward during the rising tide at Amoy with a maximum rate of $1\frac{1}{2}$ knots. The set was southwestward with a falling tide at Amoy, with a maximum rate of about 2 knots. These observations were made at spring tides.

About 5 miles westward of Chapel Island, in the northeast monsoon, the tidal current sets west-southwestward at the commencement of the falling tide, then southwestward, and, during the last 3 hours, southeastward. During the rising tide the tidal current sets northward. The tidal currents near Chapel Island appear, therefore, to be rotary.

COAST FROM RED BAY TO TONGSANG HARBOR (*H. O. Chart 3177*).—The coast trends southwestward about 21 miles from Black Point to Thunder Head. Hutow Bay is an extensive indentation within this section. Thunder Head is the extremity of a peninsula forming the eastern side of Tongsang Harbor.

Rees Pass and Blakeney Pass are passages between short sections of this coast and off-lying islands.

Coast.—Crab Point ($23^{\circ}58' N.$, $117^{\circ}48' E.$, *H. O. Chart 2517*) is about $2\frac{3}{4}$ miles south-southwestward of Black Point. A rock 9 feet high and a rock 10 feet high lie close together on the beach in a position about $1\frac{3}{4}$ miles northward of Crab Point. Crab Point is the extremity of a prominent headland with several high peaks, of which the highest is 236 feet high. A large boulder is on the western part of the headland. Two drying rocks lie close off the southern side of the headland, and about 1,200 yards west-southwestward of Crab Point is a drying rock 13 feet high with other drying rocks around.

The coast between Crab Point and Tagau Point forms a bay with shores consisting of low sand hills. Tagau Point is about 3 miles south-southwestward of Crab Point. Two Boulder Point, 1 mile northward of Tagau Point, is marked by red sand hills and cliffs 30 feet high. Close westward of Tagau Point is a fort. Town Hill, 312 feet high, has on it a walled town and several trees, and lies about $1\frac{1}{2}$ miles northwestward of Tagau Point. Fair shelter from winds northward of east-northeast can be taken southward of Tagau Point in depths of 4 to 6 fathoms over a bottom of sand. The recommended position is with the fort bearing 348° .

Off-lying islands and dangers.—Pass Rock lies about $1\frac{1}{4}$ miles northeastward of Crab Point, and has over it a depth of 6 feet. Depths of $4\frac{1}{4}$ fathoms extend as far as 200 yards southward from Pass Rock.

Cleft Islet, $\frac{3}{4}$ mile eastward of Crab Point, is 54 feet high. A rock above water lies about 150 yards northward of Cleft Islet; the intervening ground is foul. Cleft Rocks lie about 600 yards northward of Cleft Islet. The southern rock has over it a depth of 1 foot, and the northern rock is awash at low water. Outer Cleft Islet, 800 yards eastward of Cleft Islet, is 6 feet high.

Thomson Rock, about 1,700 yards northeastward of Cleft Islet, has over it a depth of 3 fathoms. The depths around the rock are 5 fathoms. A small 5-fathom patch lies about $1\frac{1}{4}$ miles east-northeastward of Cleft Islet. Crab Point bearing 237° , and in range with Town Hill, leads between Pass Rock to the northwestward and Cleft Rocks and Thomson Rock to the southeastward.

Spire Islet (see view on *H. O. Chart 2517*), about $1\frac{1}{4}$ miles south-southwestward of Cleft Islet is 69 feet high, and is the easternmost of a group of four islets. A square column marks Spire Islet. The

westernmost islet is 45 feet high, and lies about 600 yards westward of Spire Islet. The northernmost islet is 35 feet high, and lies about 700 yards north-northwestward of Spire Islet. An islet 35 feet high lies close northwestward of Spire Islet. The four islets rise from an extensive rocky ledge over which the depths are less than 5 fathoms. A detached shoal, with a least depth of $4\frac{1}{4}$ fathoms, lies off the western edge of this ledge in a position about $\frac{3}{4}$ mile west-northwestward of Spire Islet.

Hut Islet lies about 200 yards within the eastern extremity of a rocky ledge, Hut Rocks, which extends about 1,200 yards eastward from Tagau Point. Portions of Hut Rocks are above water. A heavy swell sets around Hut Islet. Tagau Rock, over which the depth is 3 feet, lies about 600 yards south-southwestward of Hut Islet. A shoal with depths of $3\frac{1}{4}$ to 5 fathoms extends north-northeastward from a position about $\frac{1}{2}$ mile northeastward of Hut Islet to a position about 800 yards southwestward of the westernmost of the Spire Islets. The general width of the shoal is about 600 yards. A detached patch of $4\frac{3}{4}$ fathoms lies between the northern end of this shoal and the westernmost of the Spire Islets.

Baker Rock, about 1 mile south-southwestward of Spire Islet, has over it a depth of 3 feet. The depths as far as 200 yards northward from Baker Rock are 3 to 4 fathoms.

Outlying danger.—Knob Rock ($23^{\circ}55' N.$, $117^{\circ}52' E.$, *H. O. Chart 2517*) lies about 5 miles eastward of Tagau Point. The rock is 60 feet high, and has a boulder on its summit.

Blakeney Pass—Directions.—Blakeney Pass is the inshore passage between the coast from Tagau Point to Black Point and the off-lying islets and dangers. It is a convenient channel for vessels of low power proceeding against the northeast monsoon.

Vessels from the southward or westward should pass at least $\frac{1}{2}$ mile southward of Hut Islet so as to clear Tagau Rock. When Crab Point bears 14° , and is in range with the conspicuous peaked sand hill westward of Black Point, course should be changed to that heading until Spire Islet bears 119° and is in range with Knob Rock. Course should then be altered to pass between Cleft Rocks and Pass Rock, and northwestward of Thomson Rock, by keeping Town Hill bearing 237° astern and in range with Crab Point. Note, however, that vessels must be on the 237° stern range before Knob Rock opens northeastward of Cleft Islet.

The track recommended in the preceding paragraph leads over the extensive shoal, with a least depth of $3\frac{1}{4}$ fathoms, between Hut Islet and the westernmost of the Spire Islets. A vessel can proceed through Blakeney Pass in depths of not less than 6 fathoms by rounding Hut Islet at a distance of $\frac{1}{4}$ mile and then bringing the islet to bear 190° astern until Spire Islet bears 90° . A northeasterly course should then

be steered to pass between Crab Point and Clefi Islet to a position where the directions already set forth can be followed.

Hutow Bay.—Black Head (Hutow Shan) ($23^{\circ}54' N.$, $117^{\circ}45' E.$, *H. O. Chart 2516*) marks the northeastern point of the entrance to Hutow Bay. Black Head is about $1\frac{3}{4}$ miles west-southwestward of Tagau Point, and is the southernmost and most remarkable of five hills forming the southern part of a peninsula. The hills are smooth and round, and there are sandy valleys between them. A partly drying spit extends about $3\frac{1}{2}$ miles southwestward from the western side of the peninsula.

Rees Point is the southwestern point of the entrance to Hutow Bay. The point is the extremity of a small peninsula, connected to the mainland by a sandy isthmus, and marked by a rocky eminence 70 feet high. Rees Point is about $8\frac{1}{2}$ miles southwestward of Black Head.

The Hutowshan River flows southwestward in Hutow Bay along the western side of the peninsula marked by Black Head. Within the entrance the river is deep, but the channels are narrow and intricate; buoys should be placed before entering the river.

Vessels could possibly ride out a strong northerly wind in a depth of 4 fathoms in a position about 600 yards off the peninsula marked by Black Head. If the wind should increase to a gale, however, or if the wind should draw to the eastward, this position should be left immediately and refuge sought off Chimney Island (p. 505) or in Tongsang Harbor.

The coast trends south-southwestward about $5\frac{1}{2}$ miles from Rees Point to Thunder Head. The latter is 474 feet high, and the southern extremity of a peninsula that is steep to except on its eastern side. Some rocks lie about 200 yards off this side. Fall Peak, 930 feet high, lies about $3\frac{3}{4}$ miles north-northeastward of Thunder Head, and is very sharp. Fall Peak and a hill 792 feet high, less than $\frac{1}{2}$ mile south-eastward, form a saddle-shape.

Islands and dangers off the coast between Black Head and Thunder Head.—Dansborg Island ($23^{\circ}49' N.$, $117^{\circ}46' E.$, *H. O. Chart 2516*) lies about 5 miles southward of Black Head. The island is marked by three peaks, each about 156 feet high. Northward and northwestward of the island the water is shoal. Boats can land, not without some difficulty, on the southeastern side of the island.

Skead Islet, 40 feet high, is about $1\frac{1}{2}$ miles west-northwestward of Dansborg Island. A reef extends a short distance off its eastern end. A rock 30 feet high lies in the channel between Dansborg Island and Skead Islet in a position about 800 yards southeastward of Skead Islet. A reef extends a short distance off the western end of the rock. A vessel reported (1935) striking a submerged obstruction, probably a rock, in a position nearly $1\frac{1}{4}$ miles westward of Skead Islet. Gu Rock, 2 miles west-northwestward of Skead Islet, dries 3 feet.

Ching Rock, nearly $1\frac{1}{2}$ miles northward of Skead Islet, dries 6 feet. It is the highest part of an extensive reef that extends about 400 yards eastward of the rock; the northeastern portion of the reef breaks at low water. The easternmost of the Simplicia Rocks bearing 178° , and open eastward of Skead Islet, leads about 600 yards eastward of the reef.

Flying Fish Rock, nearly 2 miles northwestward of Skead Islet, dries 3 feet. The depths close around the rock are 5 to 8 fathoms.

The Rees Islands lie eastward and east-southeastward of Rees Point. There are four large islands in the group and several islets and rocks. Chimney Island, the northwesternmost, is 227 feet high, and lies with its southern extremity about $1\frac{1}{2}$ miles eastward of Rees Point. The southernmost island, Southeast Island, is separated from Chimney island by a channel, nearly 2 miles wide, in which are the other two islands of the group, Flat Island and High Island. High Island is 300 feet high. The Rees Islands are barren, and are visited only by fishermen.

Simplicia Rocks, consisting of several islets and rocks, extend over a distance of 1 mile in a northwest and southeast direction. The largest islet is about 1 mile northeastward of Southeast Island. A reef drying at low water lies about 200 yards northeastward of the easternmost rock of the group.

The two Pass Islets, each with a peak about 90 feet high, lie close together in a position about $\frac{1}{2}$ mile southward of Rees Point. The channel between the islets and the mainland is about 400 yards wide, and is used by junks despite strong tidal eddies. A rock above water is close off the northern of the Pass Islets.

Rees Rock lies about 1 mile offshore in a position about $1\frac{1}{4}$ miles southward of the Pass Islets. The rock dries 12 feet. East Rock, about 200 yards eastward of Rees Rock, breaks at low water.

Anchorage—Caution.—Anchorage can be obtained in a depth of 6 fathoms about $\frac{3}{4}$ mile westward of the southern extremity of Chimney Island, of the Rees Islands group. The recommended position is about 400 yards northward of a black, rocky islet.

Caution must be exercised in the vicinity of the Rees Islands. The sea rises quickly after a wind sets in; the seas overtop, indicating a very uneven bottom.

Fishing stakes have been reported as far as 10 miles southward, and as far as 5 miles northeastward, of the Rees Islands.

Tidal currents.—Near Chimney Island in October the tidal ebb current has been observed to set between south and southwest with a maximum rate of $1\frac{1}{4}$ knots. The flood current sets between northeast and east-northeast with a maximum rate of 1 knot.

In a position about $1\frac{1}{2}$ miles southeastward of Southeast Island the ebb was observed to set between south and southwest, and the flood

between north-northwest and northwest; the rate of each current was $1\frac{1}{2}$ knots.

Rees Pass (*plan on H. O. Chart 2516*).—The western side of Rees Pass is formed by Rees Rock, the Pass Islets, and the mainland south-southwestward of Rees Point; the eastern side of the passage is formed by the Rees Islands.

The fairway is about $\frac{3}{4}$ mile wide between the dangers on either side; the depths are 10 fathoms or over.

TONGSANG (TUNGSHAN) HARBOR (*H. O. Chart 2516*).—Thunder Head is the eastern point of the entrance to an extensive indentation consisting of Tongsang Harbor and Tongsang Basin. The western point of the entrance lies about $3\frac{3}{4}$ miles westward of Thunder Head.

Tongsang Harbor is the southern and deep portion of this indentation; Tongsang Basin is shoal, and has been only partially examined. A boat channel connects Tongsang Basin with Chaoan Basin to the westward.

Tongsang Harbor is an excellent anchorage, and affords refuge in a typhoon.

Depths.—The depths in Tongsang Harbor between a bank off the eastern shore and the Mid Islands are 7 to 15 fathoms. The same depths are available between the Mid Islands and Pagoda Island.

The depth in the recommended anchorage position is 12 fathoms.

Shores.—The eastern shore of the harbor is steep to as far as 1 mile northward of Thunder Head. A broad bank, with depths less than 3 fathoms, lies off the eastern shore farther northward. Fall Peak (p. 504) is a useful mark.

Close within the northern shore of Tongsang Basin is Greene Range, consisting of rugged mountains terminating northeastward in Thumb Peak.

The western point of the entrance to Tongsang Harbor has off it an islet. A headland about $\frac{1}{2}$ mile northeastward of this point has on it three pagodas conspicuous from seaward. A peninsula about $\frac{3}{4}$ mile northward of this headland has near its eastern extremity the walled town of Tungshan.

Islands and dangers.—Yunan Rock, a pinnacle over which the depth is 2 fathoms, lies in the entrance to Tongshan Harbor in a position about $2\frac{3}{4}$ miles southwestward of Thunder Head. A mud bank, with a least depth of $3\frac{3}{4}$ fathoms, lies nearly midway between Yunan Rock and Thunder Head.

Pagoda Island, consisting of a northern portion and a southern portion connected by a sand spit 20 feet high, lies nearly midway between Thunder Head and the peninsula marked by the town of Tungshan. The channel between Pagoda Island and this peninsula is marked by strong tide rips; not even junks venture through it.

The channel between Thunder Head and Pagoda Island has depths of 9 to 18 fathoms and is about 1 mile wide. A pagoda at the western end of the southern portion of the island has an elevation of 294 feet. Rocks and shoal water extend as far as 600 yards southeastward from the eastern end of the northern portion of the island.

The Mid Islands lie about $\frac{3}{4}$ mile northeastward of the northern portion of Pagoda Island. Rocks extend as far as 300 yards from the southern extremity of the southernmost of the three Mid Islands. A mud bank extends $\frac{1}{2}$ mile northward from the middle island. The channel between the Mid Islands and Pagoda Island is about $\frac{1}{2}$ mile wide, and has depths of 7 to 17 fathoms.

The Sisters Islands lie about $1\frac{1}{2}$ miles north-northeastward of the northernmost of the Mid Islands.

Anchorage.—Good anchorage can be taken with Fall Peak bearing 60° and the highest part of the Sisters Islands bearing 358° . A British naval vessel rode out a typhoon in 1913 that passed between Tongsang Harbor and Amoy Harbor. Another British naval vessel in 1924 found fishing stakes, usually not visible above water, extending eastward and westward through this anchorage position and extending as far as 800 yards southward from it. This vessel, which drew 13 feet, proceeded northward of the line of fishing stakes and took up a good berth with the Sisters Islands bearing 3° and 2,300 yards distant.

Anchorage can also be taken in the channel between the Mid Islands and Pagoda Island. The recommended position is in a depth of 12 fathoms with the Sisters Islands showing through the two northern Mid Islands. Care must be taken to stay at least 400 yards off the Mid Islands to avoid a mud bank. A British naval vessel in 1935 anchored in this channel with the pagoda on Pagoda Island bearing 235° , distant 1,900 yards; the depth here was 16 fathoms. The tidal currents are strong.

Tides.—The mean high water interval in Tongsang Harbor is 11h. 20m.; the mean range is 9.8 feet, and the spring range is 12 feet.

Directions.—The Sisters Islands bearing less than 5° , and well open eastward of the Mid Islands, leads eastward of the mud bank between Yunan Rock and Thunder Head. In clear weather a course with Thumb Peak bearing 358° , and in range with the highest part of the Sisters Islands, leads into the harbor.

COAST FROM TONGSANG HARBOR TO CHALLUM BAY (*H. O. Chart 3201*).—The coast trends generally south-southwestward from the western point of the entrance to Tongsang Harbor to Cone Point. Jokako Bay indents the coast between Cone Point and Jokako Point to the south-southwestward. At Jokako Point the coast begins a trend to the westward. Owick Bay, Chaoan Bay, and Shoal Bay, indent a section of this coast between Jokako Point and Fort Head,

about 20 miles westward. Challum Bay is entered westward of Fort Head.

Coast.—Cone Point ($23^{\circ}40' N.$, $117^{\circ}29' E.$, *H. O. Chart 3201*) lies about $6\frac{1}{2}$ miles southwestward of Thunder Head, the eastern point of the entrance to Tongsang Harbor. Cone Peak, a short distance within the point, is 890 feet high. A peaked rock, 30 feet high, with another rock $\frac{1}{4}$ mile northeastward of it, lies close eastward of the point.

Jokako Point is about 5 miles south-southwestward of Cone Point. An isolated hill, 640 feet high, is on the point; a large village is at the foot of the western slope of the hill. Jokako Peak, a conspicuous conical summit 816 feet high, is $2\frac{1}{4}$ miles northwestward of the point and has a remarkable sand patch on its southern slope.

Jokako Bay, between Cone Point and Jokako Point, is considered a poor anchorage, as numerous uncharted rocks have been reported within it. The head of the bay consists of a sandy isthmus that nearly covers. The northwestern side of this isthmus forms the eastern shore of Chaoan Bay.

The coast trends about 4 miles west-southwestward from Jokako Point to Owick Point.

Off-lying islands.—Cliff Islet lies about 1,600 yards southeastward of Jokako Point; the intervening channel is clear. A reef extends about 200 yards northward from Cliff Islet; the outer extremity of the reef dries 9 feet.

Square Islet, about $1\frac{1}{4}$ miles northeastward of Cliff Islet is 316 feet high, and is perforated at its northwestern end.

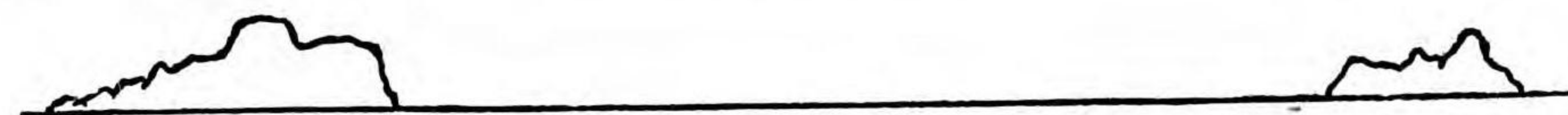
Miranda Bank, over which the depths are 8 to 10 fathoms, extends about 3 miles northeastward from a position nearly $1\frac{3}{4}$ miles southeastward of Cliff Islet. The depths in the vicinity of the bank are irregular.

Bell Island ($23^{\circ}34' N.$, $117^{\circ}25' E.$, *H. O. Chart 2585*) is about 1 mile southeastward of Jokako Point. The island attains a height of 260 feet. The northwestern and southeastern sides are perforated. Little Bell Island is about 400 yards north-northeastward of Bell Island, and is 181 feet high. A reef, with depths less than 3 fathoms, extends about 1,400 yards northwestward from Bell Island toward the mainland. The channel between the island and the coast is narrow, and vessels must proceed through it with caution; the tidal currents are strong.

Anchorage.—Fairly good anchorage, sheltered from northerly and easterly winds, can be taken about $\frac{1}{2}$ mile westward of Bell Island. The depths are 7 to 9 fathoms, and the bottom is mud. This position is open to the swell. It was reported in 1935 that this anchorage was entirely occupied by fishing stakes.

Tidal currents.—The tidal currents off Jokako Point are strong, and set northeastward and south-southwestward. There are tide rips in the vicinity of Cliff Islet and Square Islet.

In the offing the current sets northeastward from about 5 hours after high water to 1 hour before the next high water, and south-southwestward from 1 hour before high water until 5 hours after high water. These currents attain velocities of 1 to 2 knots.



*Southeast islet bearing
176°, 10½ miles distant.*

The Brothers Islets. (Original dated 1935.)

Outlying islands.—The two Brothers Islets (Siungti Yu) are 133 feet high and 77 feet high, respectively. The southeastern and higher island lies about 14 miles east-southeastward of Jokako Point; the channel between this island and northwestern island is about $1\frac{1}{4}$ miles wide, and is clear. The depths in this channel are 19 to 22 fathoms. A bluff marks the southern end of the southeastern island. A reef extends a short distance westward from this end of the island. The northwestern island has a remarkable square top. Fishing stakes were reported (1926) extending as far as 5 miles northward from the Brothers Islets.

Coast.—Owick Bay indents the coast between Owick Point ($23^{\circ}34' N.$, $117^{\circ}22' E.$, *H. O. Chart 2585*) and a rocky point, Ping Tow, about $1\frac{3}{4}$ miles west-northwestward. Owick Point is marked by Owick Hill, which is 104 feet high and forms the southern end of a narrow peninsula. A remarkable sand patch is on a hill about $1\frac{1}{2}$ miles northeastward of Owick Point. A rock 9 feet high lies about 300 yards southward of the point; a rock below water lies close westward of the 9-foot rock.

Owick Bay is sheltered from the eastward by the peninsula of which Owick Hill is the southern end. There is shelter from northerly winds in a position with the 9-foot rock bearing 135° ; depths of $3\frac{1}{2}$ fathoms are available for anchoring. The bottom is mud. Vessels should not anchor in Owick Bay during the typhoon months, as the bay is unsafe with southwesterly winds. A vessel should not attempt to anchor in depths less than 5 fathoms in the bay after nightfall, as the distance from the shore is deceptive.

Chaoan Bay is an extensive indentation between Chaoan Head and Barren Head, about $4\frac{1}{2}$ miles west-northwestward. Chaoan Head is about 1 mile west-southwestward of Ping Tow, the western point of the entrance to Owick Bay. A conspicuous pagoda, with the top at an elevation of 302 feet, stands on a hill about $2\frac{1}{4}$ miles northward of Barren Head. The western shore of the bay trends about $2\frac{3}{4}$ miles northeastward from Barren Head to Brown Point, which is marked by a hill 152 feet high. Shoal water, which can be detected

by its color, extends as far as 1 mile off the western shore of the bay between these points. Some drying rocks lie off Brown Point.

A detached shoal, with depths less than $2\frac{1}{2}$ fathoms, lies $1\frac{1}{4}$ miles south-southeastward of Barren Head and extends across the entrance to the deep channel westward of Kwadra Island. With a moderate swell the sea breaks on this bar from about 2 hours before high water to about 2 hours after high water.

Shoals extend in a westerly direction from Chaoan Head to join with the shoals extending off the western shore of the bay.

Three islands lie in Chaoan Bay. Kwadra Island, 302 feet high in its eastern portion, is nearly in the middle of the entrance in a position about $2\frac{1}{4}$ miles eastward of Barren Head. The deepest area in the bay is a channel close off the western side of the island. Some drying rocks lie within $\frac{1}{4}$ mile westward of the island, and also within a distance of 600 yards southwestward of its southern extremity. A bank with depths of less than 3 fathoms extends about $\frac{3}{4}$ mile southward from the island. Mitre Rock is a small islet, 44 feet high, lying about 800 yards eastward of Kwadra Island. High Island lies with its southwestern extremity about $\frac{1}{2}$ mile east-northeastward of Mitre Rock. The highest of several summits on High Island is 394 feet high. High Island is well wooded.

Anchorage can be had in Chaoan Bay in a depth of 6 fathoms with the northern extremity of Kwadra Island bearing 103° and $\frac{1}{2}$ mile distant. Anchorage can also be taken farther in, in a depth of $2\frac{3}{4}$ fathoms, in a position with the southwestern extremity of High Island bearing 168° , and in range with the western side of Chaoan Head. Note that fishing stakes are often laid between Kwadra Island and Brown Point.

Chaoan Bay affords good shelter during the southwest monsoon, but in the northeast monsoon a short, steep sea rises in the bay when the wind is strong and makes the anchorage uncomfortable. The bottom, of soft mud, is not good holding ground.

A vessel anchored in Chaoan Bay should proceed to Tongsoan Harbor or to Clipper Road when a typhoon threatens.

Directions.—A vessel should, from a position 2 miles southwestward of Kwadra Island, bring the summit of Brown Point to bear 19° , and in range with a dip in the hills behind the point. A 19° course then leads across the bar in a depth of about $2\frac{3}{4}$ fathoms. When the southern extremity of Kwadra Island bears 70° , and is in range with the southern extremity of High Island, a course of 38° should be steered for the anchorage, keeping in midchannel between Kwadra Island and the edge of the shoal off the western shore of the bay.

Tidal currents.—The tidal currents in Chaoan Bay turn at the times of high and low water. Northwestward of Kwadra Island the

flood current sets northwestward and the ebb southeastward. The currents attain a velocity of $1\frac{3}{4}$ knots at spring tides.

The diurnal inequality is considerable.

Shoal Bay (*H. O. Chart 3201*) is separated from Chaoan Bay to the eastward by the long narrow peninsula of which Barren Head is the southeastern extremity. Shoal Bay is very shallow.

The coast from the western point of the entrance to Shoal Bay trends about $6\frac{1}{2}$ miles southwestward to Difficult Point. An islet is close off the southeastern side of the point. Difficult Islet, 110 feet high, lies close offshore in a position about $\frac{1}{2}$ mile eastward of Difficult Point. Ternate Rock, $1\frac{1}{4}$ miles eastward of Difficult Islet, is awash. Namoa Peak (p. 513) bearing 208° astern, and in range with Pagoda Islet, leads close eastward of Ternate Rock.

Fort Head (Chenki Tow) is the southern extremity of a high peninsula lying about 13 miles westward of Chaoan Head. The peninsula is connected to the coast by a sandy isthmus. Fort Hill, near the inner end of the isthmus, is 536 feet high and conspicuous. A large sand patch on the northwestern slope of the peninsula is conspicuous from the southwestward. A small group of rocks, some of which are 10 feet high, lies nearly $\frac{1}{2}$ mile east-northeastward of Fort Head. About $1\frac{1}{4}$ miles northeastward of Fort Head, and about $\frac{1}{2}$ mile offshore, is an isolated rock 9 feet high.

CHALLUM BAY (*H. O. Chart 3201*) is an area lying westward of Fort Head and the mainland northward of it. The western side of Challum Bay is formed by Prong Island and Entrance Island.

Although most of Challum Bay is shoal, vessels can secure good anchorage with shelter from winds between northeast and southeast.

Islands and dangers in Challum Bay.—Middle Islet ($23^\circ 33' N.$, $117^\circ 04' E.$, *H. O. Chart 2585*) lies nearly in the middle of the entrance to Challum Bay in a position about 1 mile west-southwestward of Fort Head. The islet, 133 feet high, is a barren rock.

East Shoal, over which the depth is 2 fathoms, lies about midway between Fort Head and Middle Islet.

Entrance Island, on the western side of the bay, lies with Camp Point, its southern extremity about $2\frac{1}{4}$ miles northwestward of Middle Islet. The island has a length and width of slightly more than 1 mile, and in its eastern portion attains heights of 275 to 478 feet. The island is rocky and barren. There is a village on its southwestern side. Entrance Island and Middle Islet lie near the eastern edge of a bank, with depths less than 3 fathoms, extending eastward from Prong Island.

Challum Island, on the eastern side of Challum Bay, has several rocky summits; the highest, 324 feet high, is near Newrick Point, the northwestern extremity of the island. This point is about $1\frac{1}{2}$ miles east-northeastward of Camp Point. The island is marked by numer-

ous cultivated patches, and there is a village in the southeastern part. Junk Passage is a narrow channel between Challum Island and the peninsula of which Fort Head is the southern extremity. The northern part of this channel nearly dries.

Back Bay Island lies near the head of Challum Bay in a position about $3\frac{1}{4}$ miles northwestward of Newrick Point. The island attains a height of 187 feet in its southwestern part, and there is a village on the northwestern side. White Rock, 45 feet high, lies just within the edge of a mud flat extending nearly $\frac{1}{2}$ mile southward from Back Bay Island.

Prong Island forms the principal part of the western side of Challum Bay. Ford Point, the eastern extremity of the island, is about $1\frac{1}{4}$ miles southwestward of Camp Point, on Entrance Island. The island is nearly 5 miles long in a northeast and southwest direction, and is 3 miles wide. The channel between Prong Island and Entrance Island to the northeastward is narrow; a rock drying 3 feet lies in mid-channel.

Anchorage.—Good anchorage, in depths of 5 to 6 fathoms, can be obtained between Entrance Island and Challum Island. The bottom is mud. Fishing stakes obstruct the anchorage area to some extent.

Good anchorage has also been reported in a position about $\frac{1}{2}$ mile southeastward of Middle Islet.

Tidal currents.—At the anchorage between Entrance Island and Challum Island the flood current sets north-northwestward and the ebb southward; each current attains a velocity of $2\frac{1}{4}$ knots at springs. The flood current continues until about 1 hour after high water, and the ebb until about 1 hour after low water.

Directions.—Challum Bay can be entered over a least depth of $3\frac{3}{4}$ fathoms by steering 326° for the northeastern extremity of Entrance Island. This course leads about 300 yards northeastward of Middle Islet and between the shoal extending northwestward from that islet and the shoal off Fort Head. From a position about 1 mile within Middle Islet a course of about 340° should be steered, and anchorage taken in midchannel with Newrick Point bearing about 64° .

On a clear night the conspicuous sand patch on the Fort Head peninsula is a useful mark to vessels approaching Challum Bay from the southwestward.

NAMOA ISLAND (*H. O. Chart 3201*) lies with North Point, its northern extremity, about $1\frac{1}{4}$ miles south-southeastward of Fort Head. The island is about 12 miles long in an east and west direction, and attains a width of nearly $5\frac{3}{4}$ miles in the eastern part.

Namoa Island is barren; the numerous inhabitants, residing in four towns, derive their livelihood from fishing. The large stakes used

in this industry lie off the shores of the island, and in the channel between the island and the mainland to the northward. Some of the stakes are so large that a vessel colliding with them might suffer considerable damage.

Good anchorage can be obtained in Clipper Road, off the western shore of Namoa Island.

Northern shore of Namoa Island.—From North Point ($23^\circ 29' N.$, $117^\circ 07' E.$, *H. O. Chart 3201*) the northern shore of Namoa Island trends about $7\frac{3}{4}$ miles west-southwestward to Opium Point. North Point rises to a double peak, 575 feet high; rocks extend about 600 yards northeastward from the point. Namoa Wan and Lungmun Ao indent the shore between North Point and Opium Point. Islets lie in the entrance to each of these shallow bays.

Namoa Wan (Nangaow Bay) is entered westward of a point about $\frac{3}{4}$ mile southwestward of North Point. A mark for the western point of the entrance is Saddle Peak, a prominent summit, 1,722 feet high, nearly $3\frac{1}{2}$ miles west-southwestward of North Point. Namoa Peak, another prominent summit, 1,892 feet high, lies nearly in the center of the island in a position about $1\frac{3}{4}$ miles south-southeastward of Saddle Peak. The walled town of Namoa lies at the head of the bay.

Pagoda Islet, 143 feet high, and Battery Island, 355 feet high, lie in the eastern part of the entrance to Namoa Bay. Vessels drawing not more than 18 feet can anchor off the entrance to the bay northward of a line with Pagoda Islet bearing 79° . During the northeast monsoon there is a considerable swell in the bay, and the anchorage in Challum Bay is then much better.

Lungmun Ao (Shoal Bay) is entered westward of the point marked by Saddle Peak. Opium Point, the other entrance point, lies about $4\frac{1}{2}$ miles westward of Saddle Peak. Batao Rock, 50 feet high, and Bay Islet lie off the entrance to Lungmun Ao. Rocks above water lie close, southwestward and southward of Bay Islet. The town of Yankang lies on low land at the head of Lungmun Ao, where Namoa Island narrows to a width of about $\frac{1}{2}$ mile.

Clipper Road lies off the shore of Namoa Island between Opium Point and Clipper Point, about 3 miles southwestward. Clipper Point is the western extremity of Namoa Island. West Peak, 1,918 feet high, is a prominent summit about $1\frac{1}{2}$ miles eastward of Clipper Point. Baylis Bay is a small bight northward of Clipper Point.

A group of shifting sand knolls, with depths over them of $2\frac{1}{4}$ to 3 fathoms, lies in the southern entrance to Clipper Road within a distance of 5 miles southwestward of Clipper Point.

Anchorage can be taken in depths of 5 to 6 fathoms in Clipper Road during the southwest monsoon. The holding ground is good. Vessels can anchor off Baylis Bay during the northeast monsoon in depths of 5 to 6 fathoms.

Islands and dangers off the northern shore of Namoa Island.—Brig Island, 302 feet high, lies about $2\frac{1}{4}$ miles northwestward of Clipper Point.

Fort Island lies about $3\frac{1}{2}$ miles southwestward of Brig Island. The southwestern end of the island forms a tableland, on which is a fort. The channel between Fort Island and the mainland to the westward is shoal.

Folkstone Rock, over which the depth is 5 feet, lies about 2 miles northeastward of Brig Island. The southern extremity of Brig Island opens northwestward of Fort Island, and bearing about 247° , leads southeastward of Folkstone Rock.

Breaker Islet, a peaked rock about 200 feet high, lies about 4 miles northeastward of Brig Island and about 1 mile southward of the southern extremity of Prong Island.

A patch with a depth over it of $2\frac{3}{4}$ fathoms lies about 3 miles eastward of Breaker Islet.

Southern shore of Namoa Island.—From Clipper Point the southern shore of Namoa Island trends about 4 miles eastward to the western point of the entrance to a small bay. The eastern point of the entrance to this bay is marked by a pagoda.

The western point of the entrance to South Bay is about $1\frac{1}{4}$ miles east-southeastward of the point marked by the pagoda. South Bay affords good shelter during the northeast monsoon, but the bay was reported (1928) to be full of large fishing stakes. South Point is the eastern point of the entrance to South Bay. The town of Wanao lies about $\frac{3}{4}$ mile northward of South Point. Kaipan Rock and Tamsui Rock, over which the depths are $2\frac{1}{2}$ fathoms and 3 fathoms, respectively, lie in the approach to South Bay in positions nearly $2\frac{1}{2}$ miles west-southwestward and southwestward, respectively, of South Point. Three Chimney Bluff bearing 65° , and open southward of Crab Islet, leads southward of Tamsui Rock.

Crab Islet lies about $\frac{1}{2}$ mile southeastward of South Point. The islet is 110 feet high, and has a flat top. The ground between the islet and South Point is foul. Three Chimney Bluff, 380 feet high and bold, is near the southeastern extremity of Namoa Island. The chimneys from which the bluff derives its name are reported to be demolished, but the remnants are discernible as three low mounds from a distance of about 1 mile.

Eastern shore of Namoa Island.—From North Point the eastern shore of Namoa Island trends about $2\frac{3}{4}$ miles generally south-southeastward to East Point, the eastern extremity of Namoa Island. Rocks above and below water lie close off the shore between the two points. Chengao is a town about $1\frac{1}{4}$ miles within East Point. East Point is bare and cliffy, and rises to a summit 185 feet high. Hart

Rock, with a depth of 6 fathoms over it, lies about 1,200 yards eastward of East Point.

Obelisk Islet is close off the eastern shore of Namoa Island in a position about $1\frac{1}{2}$ miles southward of East Point. The islet is 254 feet high. Glengyle Rock, nearly $\frac{1}{4}$ mile southward of Obelisk Islet, has $2\frac{1}{2}$ fathoms over it, and breaks at low water. Dome Islet bearing 208° , and midway between Ruff Islet and Oeste Islet, leads southeastward of Glengyle Rock.

Tidal currents.—Off the southern shore of Namoa Island the east-northeast-going tidal current attains a rate of about 2 knots abreast Three Chimney Bluff. There are usually heavy tide rips southward of the bluff where the depths are uneven, especially during the northeast monsoon.

Northward of Namoa Island the tidal currents set parallel to the shore. The east-going tidal current runs from 3 to 5 hours after high water until 3 hours to 1 hour before the next high water. The west-going current runs from 3 hours to 1 hour before until 3 to 5 hours after high water. The rate is 1 to 3 knots, but is less off Namoa Wan.

Outlying dangers.—Dioyu Reef ($23^\circ 32' N.$, $117^\circ 12' E.$, *H. O. Chart 3201*) lies about 5 miles northeastward of North Point. The reef consists of several rocks some of which dry 10 feet. Saddle Peak bearing 240° , and in range with the southern extremity of Pagoda Islet, leads northwestward of Dioyu Reef. Vessels proceeding through the channel northward of Namoa Island usually pass northward of the reef.

Chelsiu Rocks lie about $6\frac{1}{4}$ miles eastward of North Point. There are 6 rocks in the group, each about 6 feet high. When seen from the eastward or westward these rocks appear as large boulders lying some distance apart.

A shoal, over which the depth is 21 feet, lies about $4\frac{1}{4}$ miles eastward of East Point.

Gibson Rock lies about $8\frac{3}{4}$ miles eastward of East Point. The depth over the rock is $3\frac{1}{4}$ fathoms, and in fine weather the rock is usually marked by tide rips.

ISLANDS IN THE APPROACH TO PORT SWATOW (*H. O. Chart 3201*).—There are two groups of islands in the approach to Port Swatow. The northeastern group, the Lamon Islands, lie generally southward of the eastern end of Namoa Island; the outer group, the Lamock Islands, lie within a distance of 10 miles southeastward of the Lamon Islands.

THE LAMON ISLANDS consists of four islets and a number of rocks above water and below water.

Dome Islet ($23^\circ 21' N.$, $117^\circ 08' E.$, *H. O. Chart 3201*), the northernmost islet, lies about $2\frac{1}{4}$ miles southward of Three Chimney Bluff on Namoa Island. Dome Islet is 127 feet high. A rock with a depth

over it of $2\frac{3}{4}$ fathoms lies about 600 yards westward of the islet. A bank, with depths of $4\frac{3}{4}$ fathoms or less, extends about $\frac{1}{2}$ mile south-westward from a position about $\frac{1}{2}$ mile southeastward of the islet. Half-tide Reef, portions of which dry 5 to 7 feet, lies about $1\frac{1}{4}$ miles north-northeastward of Dome Islet.

Yeng Rock, awash at low water, lies about $3\frac{1}{2}$ miles east-northeastward of Dome Islet. North Point, on Namoa Island, bearing 325° and open eastward of East Point, on the same island, leads northeastward of this danger.

Plat Islet, the westernmost of the Lamon Islands, lies about 3 miles west-southwestward of Dome Islet. Plat Islet is 42 feet high, and has a flat top. A shoal with depths of 5 fathoms or less extends about 1 mile west-southwestward from a position about $\frac{1}{2}$ mile westward of the islet. A rock drying 2 feet and a rock 2 feet high lie close off the southeastern extremity of the islet. A depth of $5\frac{1}{2}$ fathoms lies about $1\frac{1}{4}$ miles northwestward of the islet.

Mackinnon Rock, a pinnacle with a depth over it of 5 feet, lies about 1,400 yards northeastward of Dome Islet, and breaks heavily in a swell.

Oeste Islet lies about 1 mile southeastward of Plat Islet. Oeste Islet is 94 feet high, and lies at the northeastern end of a shoal with depths less than 5 fathoms. A detached patch of $4\frac{1}{4}$ fathoms lies about $\frac{1}{4}$ mile northwestward of Oeste Islet. Extensive tide rips are found in the channel between Oeste Islet and Plat Islet.

Ruff Islet, the southeasternmost of the Lamon Islands, is 85 feet high, and lies about $1\frac{1}{4}$ miles eastward of Oeste Islet. A $3\frac{1}{4}$ -fathom patch lies 400 yards north-northwestward of Ruff Islet, and a patch of 5 fathoms lies 1,400 yards north-northeastward of the islet. Dot Rock, drying 10 feet, lies 800 yards southward of Ruff Islet. Sul Rocks, drying 4 to 7 feet, lie $\frac{1}{2}$ mile southward of Dot Rock.

Norway Rock is a pinnacle with a depth over it of 2 fathoms. It lies nearly $1\frac{3}{4}$ miles south-southeastward of Ruff Islet. In calm weather during the strength of the tide, a tide rip marks this danger.

Sinta Rock, a pinnacle with a depth of 2 feet over it, lies nearly 4 miles east-southeastward of Ruff Islet. A 6-fathom patch lies about $\frac{3}{4}$ mile eastward of Sinta Rock; a 5-fathom patch lies about $1\frac{1}{4}$ miles south-southeastward of the rock.

THE LAMOCK ISLANDS (*H. O. Chart 3201*) consist of four islets and a number of rocks above water and below water.

The channel between Namoa Island and the Lamock Islands is nearly 12 miles wide. The depths in this channel are very uneven; the shoaler portions are generally marked by tide rips. The channel between the Lamock Islands and Sinta Rock, of the Lamon Islands, is nearly $5\frac{1}{2}$ miles wide. In this channel are a number of patches with depths of 5 to 9 fathoms, for which the chart is the best guide.

High Lamock Island ($23^\circ 16' N.$, $117^\circ 17' E.$, *H. O. Chart 3201*) is nearly in the center of the group. The island is partly covered with grass and other vegetation. **High Lamock Island Light** (see Light List) is shown from a black circular tower, 58 feet high, on the summit of the island. The boundary wall and the keeper's dwelling are painted white. A **fog signal** is made on a diaphone. A **light** is also exhibited from a window in a white building nearly 400 yards south-westward of the principal light. When the diaphone at the latter is out of order a fog signal is made here with a gun.

Lighthouse bearing 332° .



High Lamock Island, distant 2 miles.

East Lamock Island is about $1\frac{1}{4}$ miles northeastward of High Lamock Island. The channel between the islands is considerably narrowed by rocks extending as far as 1,400 yards southwestward from East Lamock Island. North Rocks lie within a distance of $\frac{3}{4}$ mile northeastward of East Lamock Island; the northern rock has a pyramid on it, and is devoid of vegetation.

Times Rock, $1\frac{1}{4}$ miles northeastward of North Rocks, is a pinnacle with a depth of $1\frac{1}{2}$ fathoms over it. High Lamock Island, open northwestward of East Lamock Island, leads northwestward of Times Rock; High Lamock Island, open southeastward of East Lamock Island, leads southeastward of the rock.

White Rock lies about 3 miles southwestward of High Lamock Island. Other rocks lie close off White Rock, and form with White Rock a shelter for boats.

Boat Rocks lie about 4 miles southwestward of High Lamock Island, and form the southwestern extremity of the group. Boat Rocks consist of two square rocks, each 15 feet high, about 800 yards apart. A rock lies about 800 yards southwestward of the eastern rock.

The western extremity of East Lamock Island bearing 32° , and in range with the eastern extremity of High Lamock Island, leads about 1 mile southeastward of Boat Rocks.

Anchorage.—Good anchorage has been reported by a U. S. naval vessel in a position about $\frac{1}{2}$ mile westward of High Lamock Island. The depths are less than 10 fathoms.

Tidal currents.—In the vicinity of the Lamock Islands the flood current during the southwest monsoon sets northeastward with a velocity of $1\frac{1}{2}$ knots; the ebb current sets south-southwestward with a velocity of 1 knot.

At the anchorage westward of High Lamock Island a rate of 3 knots has been reported.

COAST FROM CHALLUM BAY TO PORT SWATOW

(*H. O. Chart 3201*).—The coast trends generally south-southwestward from a position northward of the islands forming the western side of Challum Bay to the estuary of the Nanchi River, a branch of the Han River. The outer portion of the estuary forms Port Swatow. The low land northward of the estuary consists principally of the delta of the Han River.

Fort Island and Brig Island, off this section, are described with Namoa Island.

Coast.—Pagoda Hill ($23^{\circ}24' N.$, $116^{\circ}49' E.$, *H. O. Chart 3201*) is a small promontory on the coast in a position about 7 miles west-southwestward of Clipper Point, on Namoa Island. Pagoda Hill appears as an island; it is marked by a pagoda standing at an elevation of 257 feet.

The coast some distance northward of the Nanchi River entrance consists of low sand hills fronted by extensive, partially drying sand banks. One of these, Joachim Bank, is close northeastward of the entrance. The southeastern part of Joachim Bank is Joachim Spit, which extends part way across the entrance. The depths on Joachim Spit are 2 fathoms or less: it is marked by heavy rollers after strong winds.

SOUTHERN APPROACH TO PORT SWATOW (*H. O. Chart 3202*).—From Good Hope Cape the coast trends about 6 miles generally north-northwestward to the entrance to the Nanchi River branch of the Han River. The land within this section of coast is hilly; there are numerous prominent summits.

Green Islet, Squat Rock, and Bill Islet lie off this section of coast, and are useful marks for the entrance to the river.

Coast.—Good Hope Cape ($23^{\circ}14' N.$, $116^{\circ}48' E.$, *H. O. Chart 3202*) is the northeastern portion of a hilly peninsula. High Cape Summit marks this peninsula, and is 433 feet high. The summit is about $\frac{3}{4}$ mile within the extremity of the cape, and is conspicuous from the southwestward; its top appears flat, and falls away sharply on all sides. **Good Hope Cape Light** (see Light List) is shown from a white circular tower, 21 feet high, near the extremity of the cape. A **fog signal** is made with a gun. The northernmost point of the peninsula is bold, and is marked by a fort. Good Hope Cape must not be mistaken for Haimun Point. (See "Caution", p. 526.)

Tower Point lies about $3\frac{1}{2}$ miles north-northwestward of Good Hope Cape. A 630-foot summit of Vincent Range lies about 2 miles westward of Tower Point. Between the point and this range is a plain marked by steep hills 224 to 436 feet high. Signal Hill, 410 feet high, lies about $2\frac{1}{2}$ miles northwestward of Tower Point. The hill is steep on the northern side, but continues at a uniform level for a considerable distance southeastward toward Tower Point.

Peaked Rock lies on the southern side of the entrance to the river. The rock is 25 feet high, and lies barely 200 yards offshore in a position about $1\frac{3}{4}$ miles north-northwestward of Tower Point. The coast between Tower Point and the position abreast Peaked Rock is marked by conspicuous sandy beaches, close off which lie several detached rocks.

Off-lying islets and dangers.—Williams Rocks form a patch of foul ground over which the depths are 5 fathoms or less. The patch is centered about 900 yards eastward of Good Hope Cape. The northeastern side of Bill Islet bearing 327° , and in range with Sugarloaf Island, leads northeastward of Williams Rocks.

Green Islet is 72 feet high, and lies about $\frac{1}{2}$ mile northward of the fort on the peninsula marked by Good Hope Cape. Rocks extend as far as 300 yards eastward from the islet; the outer rocks are 2 feet high. A rocky reef, partially above water, extends from the islet to the mainland. A wreck, dangerous to navigation, lies approximately 800 yards eastward of Green Islet.

Bill Islet (Chih-wen-tao) is 50 feet high, and lies nearly 1 mile offshore in a position about 2 miles north-northwestward of Green Islet. Squat Rock lies 600 yards south-southeastward of Bill Islet, the rock is 15 feet high and square. A reef, on which the sea breaks at all times, extends about 600 yards southwestward from the rock. Phillips Rocks, two patches with depths over them of $1\frac{1}{4}$ and $2\frac{1}{2}$ fathoms, respectively, lie close together in a position about 700 yards southeastward of Squat Rock. A wreck, sunk in 1934 and visible above water, lies about $1\frac{1}{4}$ miles northward of Bill Islet. An obstruction, over which the sea breaks at times, is reported to lie about 300 yards northward of this wreck.

Chuan-chiao, a rock awash, lies about 1,300 yards south-southeastward of Peaked Rock.

Outlying danger—Directions for clearing.—Dove Rock ($23^{\circ}19' N.$, $116^{\circ}50' E.$, *H. O. Chart 3202*) lies nearly $3\frac{1}{2}$ miles northeastward of Bill Islet. The depth over Dove Rock is 1 fathom. A **whistle buoy**, painted in red and black checkers, is moored about 400 yards south-southeastward of Dove Rock.

The northern summit of Kakchio Promontory bearing $274\frac{1}{2}^{\circ}$ and in range with the southern extremity of Double Island (see view B on *H. O. Chart 3202*) leads northward of Dove Rock. The northern

extremity of Fisherman Islet bearing $289\frac{1}{2}^{\circ}$ and just open northward of Sugarloaf Island (see view A on *H. O. Chart 3202*) leads southward of Dove Rock. The eastern extremity of Green Islet bearing $219\frac{1}{2}^{\circ}$ and in range with the northwestern extremity of High Cape Summit (see view C on *H. O. Chart 3202*) leads eastward of Dove Rock.

PORT SWATOW (*H. O. Chart 3202*), in the outer portion of the estuary of the Nanchi River branch of the Han River, is available to deep-draft vessels throughout the year. It is the port for Chaochowfu, the capital of the province of Kwangtung, lying about 20 miles northward of the city of Swatow. A branch of the Han River, navigable by boats only, connects Swatow with Chaochowfu.

The harbor is nearly 3 miles long between the eastern limit, a line drawn southward from Old (Round) Fort, on the northern shore, and Ta Tau Point, on the southern shore.

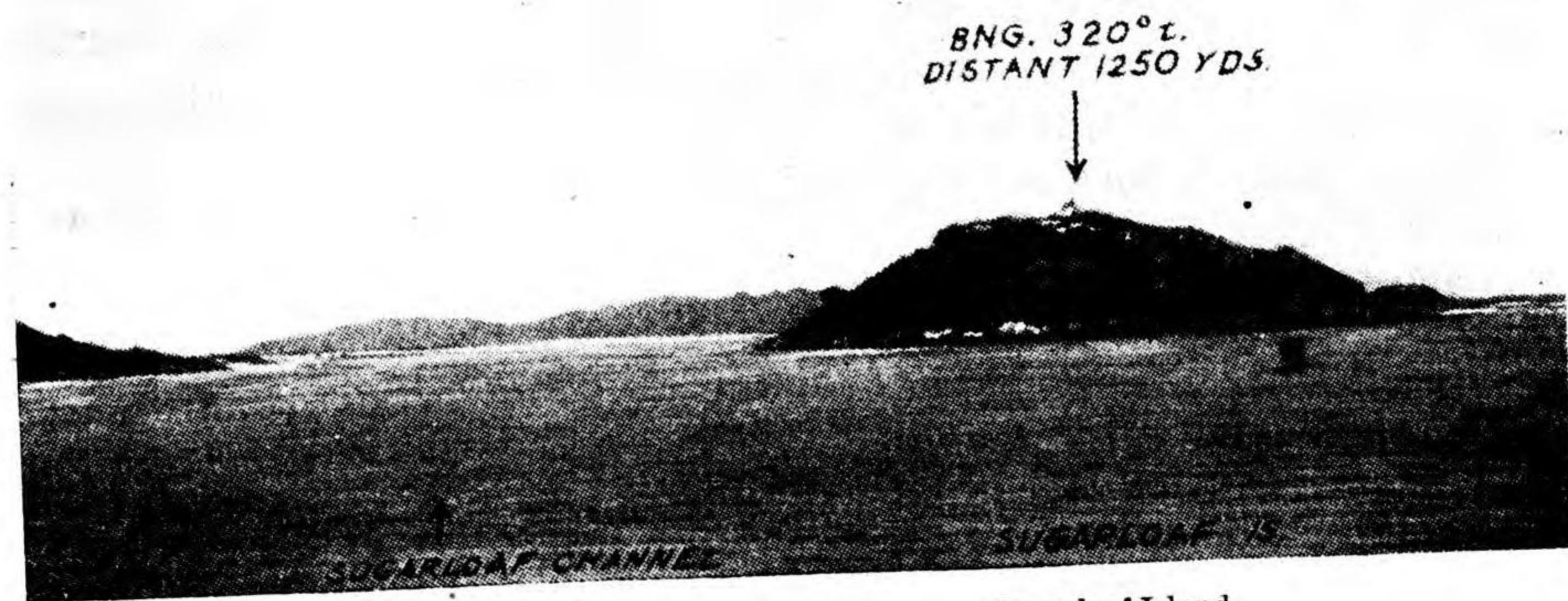
A bar extends northeastward across the entrance to the estuary from the coast adjacent to Tower Point.

Depths.—Vessels drawing $20\frac{1}{2}$ feet can cross the entrance bar and reach Port Swatow in all seasons; during the northeast monsoon a vessel drawing $21\frac{1}{2}$ feet can enter the port. Vessels of greater draft are frequently piloted into the port during spring tides.

In 1937 the bar was reported to have 2 feet less water than is shown on the chart. The depths in a section between Double Island and Old Fort were reported in 1933 to be 3 to 4 feet less than charted.

In June 1937 a vessel drawing 22 feet entered Port Swatow.

Islands and dangers in the entrance to Port Swatow.—Sugarloaf Island (Lu-yu) ($23^{\circ}20' N.$, $116^{\circ}45' E.$, *H. O. Chart 3202*), nearly 1 mile northeastward of Signal Hill, is 188 feet high. The island is about 700 yards long in a northwest and southeast direction, and is about 300 yards wide. A rock drying 8 feet and a rock drying 2 feet



Sugarloaf
Channel

Sugarloaf Island
bearing 320° ,
1,250 yards dis-
tant.

BNG. $320^{\circ} E.$
DISTANT 1250 YDS.

lie within a distance of 400 yards eastward of its southeastern extremity. **Sugarloaf Island Light** (see Light List) is shown from a red circular tower, 21 feet high, near the southeastern end of the high part of the island. The keeper's dwelling is white.

Double Island (Mu-yu) lies with its southeastern extremity about 800 yards northwestward of Sugarloaf Island, and appears as a double island on northwesterly bearings. The southern hill, 127 feet high, is the higher, and has on it a flagstaff and an old fort. A hill, 80 feet high, near the eastern extremity of the island appears square when seen from the southeastward. The white walls of some buildings on the island are conspicuous from seaward.

Guelph Rocks lie about 200 yards southward of the southeastern extremity of Double Island. These rocks dry 5 feet. The channel between the rocks and Double Island is unsafe.

Fisherman Island, 75 feet high, is about $\frac{1}{2}$ mile southwestward of Double Island.

Entrance channel.—Sugarloaf Channel leads to Port Swatow between the southwestern sides of Sugarloaf Island and Double Island and the northeastern side of Fisherman Island and the coast southeastward of the latter island. The fairway has a minimum width of about 300 yards between a spit, with depths of 2 fathoms, extending westward from the northwestern extremity of Sugarloaf Island and a rocky patch of $2\frac{3}{4}$ fathoms. Frewin Rock lies on the southwestern side of the fairway in a position about 600 yards southward of Double Island. The rock has over it a depth of $1\frac{1}{4}$ fathoms.

The tidal currents, especially the flood current, in Sugarloaf Channel are strong; eddies form off the northwestern extremity of Sugarloaf Island that make navigation difficult when much shipping is in the channel.

Note that Eastern Channel, trending along the northeastern sides of Sugarloaf Island and Double Island, was unnavigable in 1942.

Dangers in the outer harbor—Range lights.—A patch of $2\frac{3}{4}$ fathoms lies in the outer part of Port Swatow in a position about $1\frac{1}{4}$ miles west-northwestward of the northwestern extremity of Double Island.

Between Double Island and the anchorages off Swatow are numerous rows of fishing stakes. It is said that in daylight these stakes, which are placed in deep water on either side of the channel, are useful marks; at night, however, these stakes are often a hindrance rather than a help.

Fishing nets are laid off the southwestern extremity of Double Island. Buoys are frequently placed to mark these nets; a white light is usually exhibited from the outer stakes, but the light cannot be relied upon. Vessels occasionally collide with the stakes, and are

then generally directed by the local authorities to reimburse the owner for damages. Boats have frequently been swept by the tidal currents against submerged nets, in several instances with loss of life. The nets are laid out only during the outgoing tidal current.

A light is exhibited from a structure near the northwestern extremity of Sugarloaf Island, and another about 250 yards $126^{\circ}45'$ from the former light. These lights in range indicate the southwestern extremity of the fishing stakes off Double Island. (See Light List.)

Southern shore.—Kakchio Promontory is on the southern shore of the harbor in a position about 4 miles westward of Double Island. The promontory is cleft by numerous ravines, but from seaward it appears unbroken; the southern end is 486 feet high, and the northern end is 296 feet high. A hill 233 feet high and a hill 193 feet high lie $\frac{1}{2}$ mile and $1\frac{1}{4}$ miles, respectively, westward of Kakchio Point, the northeastern extremity of the promontory. On the summit of each is a conspicuous boulder; these boulders had white rectangular marks on them in 1936.

A **light** (see Light List) is shown from the head of a stone jetty extending from the northern side of the promontory.

Hills, irregular and rugged, rise from the plain between the promontory and the western portion of Vincent Range to the southward. The hills are cultivated, although strewn with boulders. Vincent Range terminates westward in a conspicuous 697-foot summit, Mount Beatty. Numerous buildings of occidental architecture on Kakchio Promontory front the harbor.

The southern shore between Kakchio Point and a point abreast Fisherman Island to the eastward is indented by Muddy Bay. A large part of the bay dries. Kinaldi Islet, 65 feet high, lies about 800 yards off the head of the bay. Another islet in the bay, in a position about $\frac{1}{4}$ mile southeastward of Kakchio Point, is 15 feet high.

Ta Tau Point, marking the upper harbor limit, lies nearly $\frac{3}{4}$ mile west-southwestward of the 193-foot hill on Kakchio Promontory. West Island, 42 feet high, and Flower Island, 120 feet high, lie off the southern shore of the harbor within a distance of 1 mile westward of Ta Tau Point.

Northern shore.—The northern shore eastward of Old Fort consists of a well-cultivated plain dotted with numerous villages.

A branch of the Han River, a creek leading to Chaochowfu, flows southward past the western end of the city of Swatow. A red conical **buoy** is moored close off the western point of the creek entrance. The customhouse, with a signal mast nearby, lies on the northern water front close eastward of the creek entrance. A conspicuous white water tower stands about 800 yards northward of the custom-

house; two radio towers, about 500 yards northeastward of the customhouse, are also conspicuous.

A boat harbor near the customhouse is marked by a **light**; at the head of each of two oil piers farther eastward is a **light**. (See Light List.)

Dangers.—A wreck lies within the quarantine anchorage in a position about $\frac{1}{4}$ mile southward of Old Fort. The wreck is marked by an unlighted black **buoy**.

Bottefurh's Rock is 50 feet high, and lies close off the northern extremity of Kakchio Promontory.

Wyoming Rock, about 150 yards north-northwestward of Bottefurh's Rock, has over it a depth of 4 feet. It is marked by a black **buoy**, surmounted by a black inverted frustum cage.

Madras Rock, 1,100 yards west-southwestward of Bottefurh's Rock, is a pinnacle over which the depth is 6 feet. It is marked by a black conical **buoy**, surmounted by a black spherical cage.

Gochang Rock lies about 400 yards north-northwestward of Gochang Point, the northwestern extremity of Kakchio Promontory. Gochang Rock covers at high water; it is marked by a black stone **beacon**, 5 feet high, with a spherical top mark.

Cheuto Rock, over which the depth is 4 feet, lies about 400 yards westward of Bottefurh's Rock.

Anchorage and moorings.—Vessels moor to buoys or anchor in the harbor by direction of the harbor master, who either boards vessels or instructs the pilot in advance.

The mooring buoys in the harbor are arranged in two rows. Each buoy has a number; the odd-numbered buoys are on the Swatow side of the harbor. The berth fixed by Buoy No. 1 can accommodate a vessel 400 feet long; the other berths accommodate vessels up to 350 feet long. The depths at the buoys are 5 to 7 fathoms.

The chart shows the numbers and positions of the mooring buoys. The areas within the harbor reserved for vessels laden with oil or explosives, and the quarantine anchorage area, are also shown on the chart.

Berthing signals are hoisted on the signal mast near the customhouse. The hoist directing a vessel to a mooring berth consists of the vessel's house or national flag over a black ball, with a numeral flag below the ball. When International Code flag "B" is displayed by itself the vessel is directed to anchor as convenient.

International Code flag "Q" hoisted below a vessel's house or national flag indicates that the vessel is in quarantine and is to proceed directly to the quarantine anchorage and await medical inspection.

Regulations—Port signals.—Port regulations, printed in English, are available at the harbor master's office in the customhouse.

The system of port signals in use in Port Swatow is described on page 41.

Typhoon anchorages.—When a typhoon approaches Port Swatow vessels usually leave the anchorage off the city and proceed to positions about midway between Old Fort and Double Island. Here the holding ground is better, and a typhoon can be ridden out in safety.

Vessels of moderate draft often proceed upriver and anchor about 800 yards northeastward of West Island. Here there will probably be less sea.

Storm warnings.—Typhoon and storm warnings are telegraphed to Swatow from the observatories in Shanghai and Hong Kong. Storm signals, according to the China Code (p. 24) are hoisted on the flagstaff near the customhouse when a typhoon is within 100 miles of Swatow. When a gale or typhoon is expected to strike the port additional signals are hoisted; the gale signal is a black ball by day or a red light at night, and the typhoon signal is two black balls by day or two red lights at night. The balls and lights are disposed vertically.

Tides—Tidal currents.—The mean high water interval at Double Island is 1h. 04m.; the mean range is 3.3 feet, and the spring range is 3.9 feet.

The tides are irregular, and are considerably influenced by the prevailing winds. With easterly winds of more than force 3 high tide may be expected later and higher, and low tide sooner and higher. With westerly winds of more than force 3 high tide may be expected sooner and lower, and low tide later and lower. It is said that during the southwest monsoon the tidal rise may be only 2 or 3 feet for a number of days. The water falls to the level of low water ordinary spring tides only after a calm of 1 or 2 days' duration, irrespective of the moon's age. As a result there is generally more water on the entrance bar than shown on the chart.

The tidal currents set directly through Sugarloaf Channel, except northwestward of Sugarloaf Island where a branch of the outgoing current runs along the northern shore of the island.

Off the city of Swatow the ingoing current runs from 1½ hours after low water to ¾ hour after high water; the outgoing current runs from ¾ hour after high water to 1½ hours after low water. The current off the southern shore of the harbor turns earlier than that on the northern side.

The ingoing current attains a rate of 2 knots, and the outgoing current a rate of 4 knots.

Pilots.—Pilotage is not compulsory, but it is advisable. The pilots are stationed on Sugarloaf Island. After being notified in advance a pilot usually proceeds to a position for boarding the vessel off Bill Islet in a white boat with a black band near the gunwale; the words "Licensed Pilot Boat" are painted on the boat.

Pilots will take a vessel in at night by permission of the harbor master.

Directions.—Vessels should not attempt to enter Port Swatow against the outgoing tidal current unless in a flat calm, or unless they are certain to have depths of 5 or 6 feet under them. Note that there is generally a heavy sea on the entrance bar with the outgoing current.

A good estimate of the least depth on the bar can be made by taking a sounding in a position about 400 yards northeastward of Bill Islet; the depth, minus 7 feet, is approximately the least depth on the bar.

A United States naval vessel reported in 1941 that the set of the current normal to the courses followed in proceeding to the harbor was pronounced; this vessel found it necessary to alter course as much as 5° at times to offset this force.

Vessels approaching from the northward should pass either eastward or westward of Dove Rock according to draft, and according to the clearing marks (p. 519). After passing the rock vessels should proceed to a position about 800 yards northeastward of Bill Islet.

Vessels approaching from the southward must pass eastward of the islets and dangers lying off the coast between Good Hope Cape and Bill Islet.

After passing Bill Islet vessels should steer 319° for the lighthouse on Sugarloaf Island. When Signal Hill bears 285°, and is in range with Peaked Rock, course should be changed to 310° to proceed through Sugarloaf Channel. After passing Peaked Rock care must be taken to keep it well open of the land northwestward of it in order to clear Frewin Rock and the 2¾-fathom patch southeastward of Frewin Rock. The 310° course should be followed until Signal Hill bears 162° and is in range with the summit of Fisherman Island; course should then be altered to 280°, and the northern extremity of Double Island kept bearing 100° astern. This course leads up the harbor. Note that this is the route followed by the local pilots in 1927.

Vessels leaving Port Swatow that observe *Guelp*¹. Rocks to be covered will find a depth of not less than 19 feet on the entrance bar.

SWATOW (23°22' N., 116°41' E., *H. O. Chart 3202*), originally known as Shantou, is built on the plain within the northern shore of the harbor abreast Kakchio Promontory. The city has several broad, paved streets. The buildings are, in most cases, two-storied stone or concrete structures. The city has an adequate water supply, an electric lighting system, and a dial telephone system. The city is the center of extensive embroidery and drawworks industries.

In 1938 the population of Swatow was about 138,000.

The United States is represented by a consul.

Pontoons—Piers.—Five pontoons, connected to the shore by wooden bridges, lie off the Swatow shore of the harbor. The total frontage is nearly 900 feet; the depths alongside vary from 13 to 19½ feet at low water of ordinary springs.

Two piers are maintained by large oil companies for use by their own tankers; the depths alongside are 18 and 34 feet, respectively, at low water of ordinary springs.

Cargo-handling.—Vessels at anchor or at moorings in the harbor handle

cargo with their own gear and lighters of 30 to 40 tons capacity. A large number of lighters is available.

Repairs.—Minor repairs can be executed. Small iron and brass castings can be made.

The salvage appliances maintained consist of two wooden barges fitted with sheer legs, one unit capable of lifting 7 tons and the other 10 tons. One of these barges is self-propelled; they are ordinarily used for lifting buoys and moorings.

Supplies.—Fresh provisions are obtainable. There are several general ship-chandler firms in Swatow.

Several water barges, each with a capacity of 35 tons, deliver drinking and boiler water.

A moderate supply of coal is available. Coal is carried aboard vessels at anchor or moorings in the harbor in baskets from lighters.

Fuel oil is obtainable. A stock of Diesel fuel is maintained. Vessels can go alongside the oil company piers and take on fuel from pipe lines.

Communications.—Swatow is in regular communication by steamer with Hong Kong and other large ports.

A railroad trends northward from Swatow to Chaochowfu.

Swatow is connected with the general telephone and telegraph systems. Messages can be telegraphed from the city for relay by cable to countries overseas.

Radio.—A radio station in the city is open to public correspondence.

Time signal.—A time signal is made from the flagstaff near the customhouse on Saturdays at noon, standard time, corresponding to 4h. 00m., Greenwich civil time, at which instant a black ball is dipped from the masthead and a gun is fired. The signal is said to be unreliable.

Climate.—The climate is subtropical. The summers are long and hot; the winters are damp and chilly. The heat of summer is tempered by the northeast monsoon; typhoons strike the port from time to time.

Sanitary conditions—Hospitals.—Sanitary regulations are not carefully enforced, according to one observer. Dysentery, smallpox, and typhoid must be guarded against at all times; drinking water should be boiled, and vegetables should not be eaten in the raw state.

Three hospitals, each with 40 or more beds, will receive seamen. There are 6 hospitals in all.

COAST FROM PORT SWATOW TO HIECHECHIN BAY
(*B. A. Chart 1962*).—The coast trends generally southwestward from Good Hope Cape to Tongmi Point, the northeastern point of the entrance to Hiechechin Bay. This section of coast has a length of about 55 miles.

The principal indentation is Haimun Bay, which is not, however, considered as affording anchorage to deep-draft vessels. Anchorage, limited by the size of a vessel and the season of the year, can be taken westward of Tide Point, near Breaker Point, in Tungáo Road, and near Kupchi Point.

Coast.—Tide Point ($23^{\circ}13' N.$, $116^{\circ}47' E.$, *B. A. Chart 1962*) is the southernmost point of Good Hope Cape; the coast between Tide Point and Haimun Point, about 8 miles southwestward is indented by Hope Bay. The western shore of this bay must not be approached closer than 1 mile, as detached rocks lie within this distance along a section $3\frac{1}{2}$ miles northward of Haimun Point. During the rising tide there is often a heavy tide race off Tide Point.

Caution.—In thick weather, when neither the low, white, sandy shore of Hope Bay nor Namoa Island have been visible, several vessels have mistaken Haimun Point for Good Hope Cape. The point and the cape resemble each other; on each are three distinct high points with sandy beaches between them.

Anchorage westward of Tide Point.—Close westward of the Tide Point is a small bay. The western point of the entrance to this bay is marked by Peaked Rock, which lies just off the point. Cockchafer Rock, a pinnacle with a depth of 4 feet over it, is about 800 yards southwestward of Peaked Rock. The eastern entrance point of the bay is marked by a fort, near which is a large tree. The fort has a whitewashed mark on one side. Sunken rocks extend about 200 yards from the eastern entrance point. Vessels with local knowledge find secure anchorage within this bay during the northeast monsoon. The holding ground, of mud and sand, is good. The sunken rocks off the eastern point of the entrance should be given a berth of at least $\frac{1}{4}$ mile.

Tatapu Creek is entered in a position about $1\frac{1}{2}$ miles northwestward of Peaked Rock. The creek connects with the Nanchi River branch of the Han River a short distance above the city of Swatow. On the eastern side of the entrance to Tatapu Creek is a hill, 130 feet high, with a ruined fort on its summit. Reefs extend 600 yards southwestward from the coast southward of the fort. A rock awash lies at the outer end of the reef.

The creek is entered over a bar over which the least depth is $1\frac{1}{4}$ fathoms. West Islet, 110 feet high, and East Islet, 100 feet high (*H. O. Chart 3202*) lie in the entrance to Tatapu Creek. Tortoise Islet, 137 feet high, lies about $1\frac{1}{4}$ miles within the creek entrance.

Large fishing junks approach the entrance to Tatapu Creek from the southwestward, and pass close southeastward of East Islet.

Coast.—About $1\frac{1}{4}$ miles northward of Haimun Point is a hill, 600 feet high, on the summit of which is an artificial mound. A pagoda stands on a hill about $6\frac{1}{2}$ miles northward of Haimun Point, and about $7\frac{1}{2}$ miles north-northwestward of the same point is another hill also marked by a pagoda. West Peak is about $2\frac{1}{2}$ miles westward of the latter pagoda.

Haimun Bay indents the coast between Haimun Point and a point, marked by a reef-fringed headland, about 7 miles southwestward. Parkyns Rock lies in the entrance to this bay in a position about 1 mile south-southwestward of Haimun Point. The rock is divided into two parts. The sea breaks on Parkyns Rock only when there is a heavy swell. Reefs extend as far as $\frac{1}{4}$ mile off the southwestern point of the entrance to Haimun Bay.

The Haimun River flows into the head of the bay. The least depth over a bar across the entrance to the river is 10 feet. A rock awash lies nearly 1 mile southwestward of the eastern point of the entrance to the river. The town of Haimun lies on the east bank of the river about 1 mile within the entrance. A channel connects the Haimun River with the Han River.

The coast trends about 4 miles southward from the southwestern

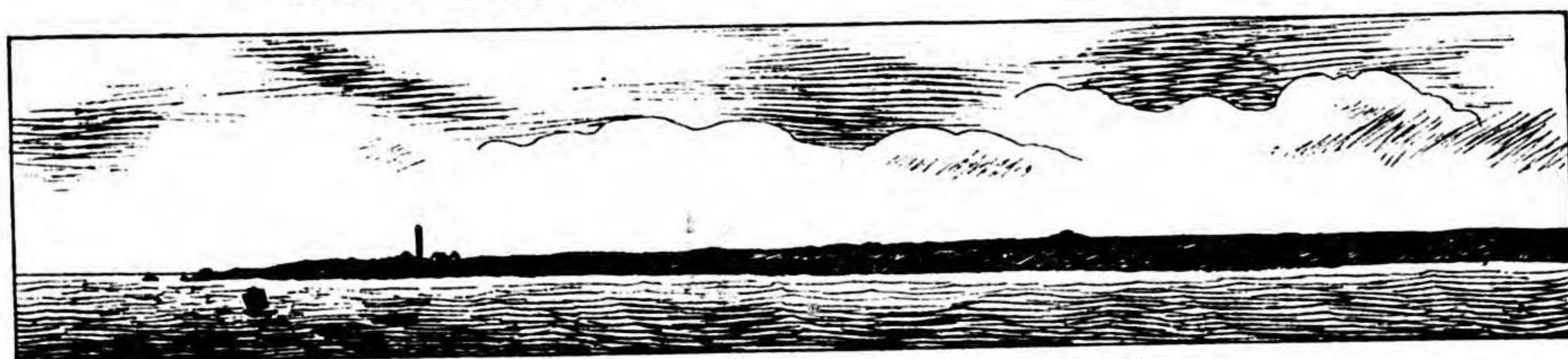
point of the entrance to Haimun Bay to Rocky Point. Tsinghai (Tonglai) Point is about $1\frac{1}{4}$ miles southwestward of Rocky Point. Numerous rocks above water and sunken rocks lie off the coast between these two points and also between Tsinghai Point and Breaker Point, about 5 miles southwestward; the outermost is a rock about 1,200 yards southeastward of Tsinghai Point.

A creek entered about 1 mile westward of Tsinghai Point leads to the walled town of Tsinghai. On the eastern side of the creek near the entrance there is a remarkable dome-shaped tower and a low, square fort.

Breaker Point Anchorage ($22^{\circ}56' N.$, $116^{\circ}26' E.$, *H. O. Chart 2599*).—Breaker Point is marked by Dome Hill, 111 feet high, which

Breaker Point Lighthouse.

Dome Hill.

Breaker Point from the eastward, distant $1\frac{1}{2}$ miles.

Round Hill.

Dome Hill.

Breaker Point Lighthouse.

Breaker Point from the southwestward, distant about $4\frac{1}{2}$ miles..

rises from a red sand dune on the point. Round Hill, 380 feet high, lies about $2\frac{1}{2}$ miles northward of the point. A remarkable square stone lies near the coast in a position about $3\frac{1}{4}$ miles westward of the point. **Breaker Point Light** (see Light List) is shown from a circular tower, 120 feet high and painted in black and white horizontal bands, situated about $\frac{3}{4}$ mile eastward of the point. The keeper's dwelling and the boundary walls are painted white. The **fog signal** is a gun.

As far as $\frac{1}{2}$ mile off Breaker Point and the coast immediately eastward are rocks above and below water. The highest rock, 25 feet high, lies about 800 yards southeastward of Breaker Point. There are also rocks above and below water extending as far as 2 miles southwestward from Breaker Point. Korea Rock, over which the depth is 2 fathoms, lies near the outer edge of the latter. Sunk Rock, over which the depth is 7 feet, lies about $\frac{1}{2}$ mile north-northwestward of Korea Rock; foul ground extends as far as $\frac{1}{2}$ mile

westward from Sunk Rock. Black Rock, 10 feet high, and Flat Rock, 8 feet high, lie about $\frac{3}{4}$ mile north-northeastward and northeastward, respectively, of Korea Rock. The 25-foot rock southeastward of Breaker Point bearing 55° , and in range with Breaker Point lighthouse, leads close southeastward of the dangers extending southwestward from Breaker Point; at night the light should bear less than 50° .

An islet, 52 feet high, lies about $\frac{1}{2}$ mile offshore in a position nearly 2 miles westward of Breaker Point.

Anchorage, fairly good during the northeast monsoon, can be taken in a position about $\frac{1}{2}$ mile west-southwestward of the 52-foot islet, in a depth of $5\frac{1}{2}$ fathoms. In this position the islet bears about 76° and is in range with Dome Hill.

A vessel approaching this position from the southward can pass westward of the dangers extending southwestward from Breaker Point by steering more than 320° for the remarkable square stone on the coast about $3\frac{1}{4}$ miles westward of the point. It was reported in 1939, however, that the stone was difficult to identify.

Tungao Road (*plan on H. O. Chart 2599*).—From Breaker Point the coast trends about 10 miles westward to the entrance to a river. The intervening coast is irregular, with numerous off-lying rocks. The sea breaks at low water on a bar across the entrance to this river.

About 2 miles northward of the eastern point of the entrance point of the river is a pagoda. The village of Tungao lies on the coast about $1\frac{1}{4}$ miles southeastward of the eastern entrance point. White Rock lies about $\frac{1}{4}$ mile offshore in a position about $3\frac{1}{2}$ miles southeastward of this point. The rock has a white top and is conspicuous from the southwestward. Hai Lung Rock, over which the depth is $1\frac{1}{2}$ fathoms, lies about $1\frac{3}{4}$ miles southward of White Rock.

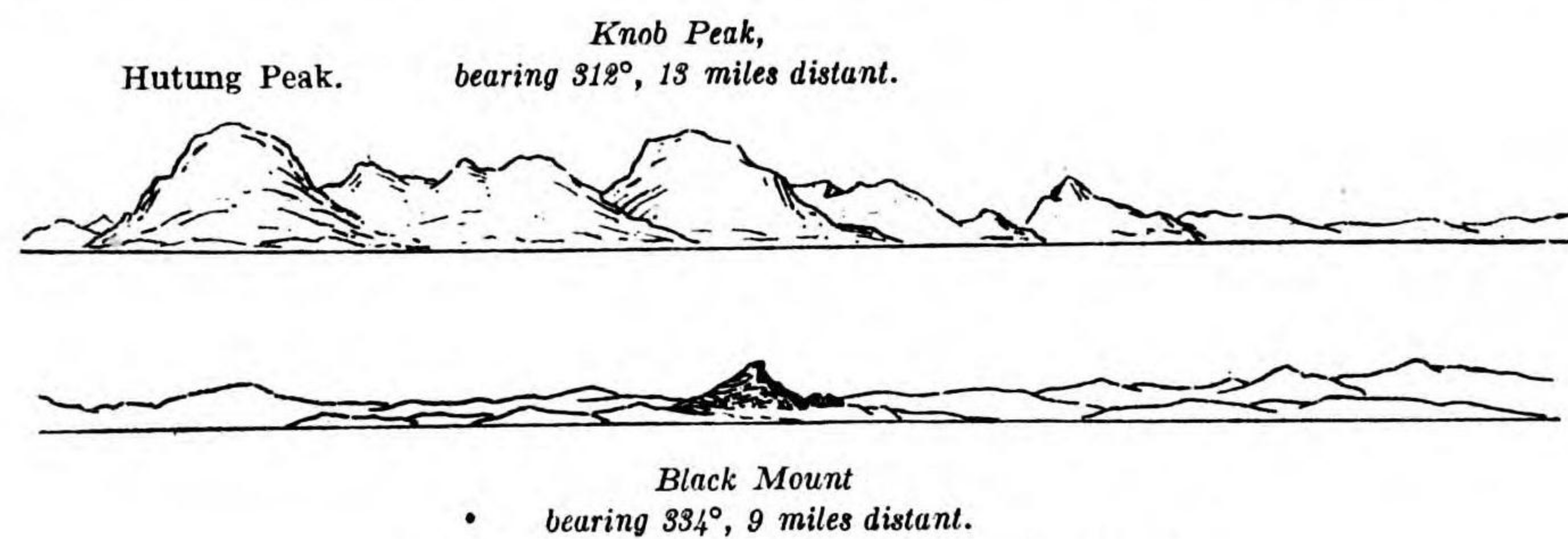
Anchorage, fairly good during the northeast monsoon, can be taken in Tungao Road. The holding ground is good, but a heavy swell often sets in from the southward. The recommended position is in a depth of $5\frac{1}{4}$ fathoms with the pagoda within the eastern entrance point of the river bearing 348° .

Kupchi Point Anchorage ($22^{\circ}50' N.$, $116^{\circ}04' E.$, *plan on H. O. Chart 2599*).—The coast trends about 15 miles generally southwestward from the village of Tungao to Kupchi Point; this section is low and sandy.

Kupchi Point has a rugged summit. A ruined fort stands on the coast about 600 yards northward of the point. Black Mount, 230 feet high, is a conspicuous mark; it consists of a conical hill rising from red sand dunes. It can often be seen at night. Black Mount lies a short distance within the coast in a position about 4 miles northeastward of Kupchi Point. Reefs extend $\frac{1}{2}$ mile from the

coast abreast the summit. The walled village of Kupchi is on the western bank of a river that is entered about 2 miles north-northwestward of Kupchi Point. There are two forts on the eastern side of the entrance and another fort on the western side. Between the latter fort and the village is a two-storied pagoda.

Kupchi Islet, 70 feet high, lies 800 yards southward of Kupchi Point; the intervening channel is obstructed by rocks. A rock above water lies about $\frac{1}{2}$ mile eastward of the islet, and another about $\frac{1}{2}$ mile southward of the islet. Turtle Rock, 15 feet high, lies about 1 mile southward of the islet; two rocks above water lie 800 yards northward and northeastward, respectively, of Turtle Rock. Balfour Rock, over which the depth is $2\frac{1}{2}$ fathoms, is about $1\frac{1}{4}$ miles southeastward of Kupchi Islet. A patch with a least



Two views of coast near Kupchi Point.
(Originals dated 1935.)

depth of $4\frac{1}{2}$ fathoms lies about $\frac{1}{4}$ mile westward of Balfour Rock. Vessels should not pass within $\frac{1}{2}$ mile southward of Turtle Rock and Balfour Rock. Shag Rock, 4 feet high, lies about $\frac{3}{4}$ mile southward of the fort on the western side of the entrance to the river leading to Kupchi village. A patch of $1\frac{1}{2}$ fathoms lies about $\frac{1}{2}$ mile westward of Shag Rock.

During the northeast monsoon small vessels can take anchorage about 800 yards southwestward of Shag Rock; there is usually a heavy ground swell.

Outlying dangers.—In 1904 a vessel drawing 24 feet struck a rock, or other obstruction, in a position about $4\frac{1}{2}$ miles east-southeastward of Kupchi Point.

A wreck, dangerous to navigation, lies sunk in a position nearly 9 miles southeastward of Kupchi Point.

Coast.—Hutung Point ($22^{\circ}48' N.$, $115^{\circ}57' E.$, *B. A. Chart 1962*) lies about 8 miles westward of Kupchi Point. Hutung Point has on it a fort, near which is a conspicuous dome-shaped building resembling a beehive (see view on *B. A. Chart 1962*). Hutung Peak, 715 feet high, is a conspicuous summit lying about 3 miles northeastward of Hutung Point; Knob Peak, 681 feet high and also conspicuous, lies

a short distance farther north-northeastward. A ridge of hills extends southeastward from Hutung Peak to the coast.

Close westward of Hutung Point is the entrance to Hutung River; the depth over a bar across the entrance is 6 feet.

Off-lying islets and dangers.—A small islet, surrounded by rocky reefs, lies about 1 mile southeastward of Hutung Point. Figure Rock, one of those surrounding this islet, has an unusual shape on westerly bearings. A flat rock, 9 feet high, with sunken rocks around, lies nearly $1\frac{3}{4}$ miles southeastward of Hutung Peak and about $\frac{1}{2}$ mile offshore. Rocks above water and sunken rocks fringe the coast as far as $2\frac{1}{2}$ miles northeastward from a position abreast the 9-foot rock. The outermost of the fringing rocks has over it a depth of less than 6 feet and lies nearly $\frac{3}{4}$ mile offshore in a position 2 miles east-northeastward of the 9-foot rock.

Coast.—Black Rock Point (*H. O. Chart 3200*) lies nearly $2\frac{3}{4}$ miles west-southwestward of Hutung Point. From Black Rock Point the coast consists of a sandy plain trending nearly $5\frac{3}{4}$ miles generally southwestward to Tongmi Point, the northeastern point of the entrance to Hiechechin Bay.

Off-lying rocks.—Black Rock, 30 feet high and conspicuous, lies about 300 yards off Black Rock Point.

Parry Rocks, about 1 mile offshore in a position nearly $1\frac{3}{4}$ miles southwestward of Black Rock Point, have over them a least depth of 2 fathoms.

Tungki Rocks are centered in a position about $1\frac{1}{4}$ miles southeastward of Tongmi Point. The highest of the several black rocks forming the group is 20 feet high. The channel between these rocks and the coast is unsafe.

Suwonada Rock, a pinnacle with a depth of $2\frac{1}{2}$ fathoms over it, lies about $\frac{3}{4}$ mile southeastward of Tongmi Point.

Thumb Rock, 15 feet high, is one of a group about $\frac{1}{2}$ mile eastward of Tongmi Point.

HIECHECHIN BAY (*H. O. Chart 3200*).—The coast between Tongmi Point and Chilang Point, about $14\frac{1}{2}$ miles west-southwestward is indented by Hiechechin Bay.

Vessels of deep draft can anchor in the bay in either monsoon. The depths in the entrance are 10 fathoms; they decrease gradually to the shore.

The shores of Hiechechin Bay are marked by many villages. The principal town, Kitchioh, is within the eastern shore in a position about $4\frac{1}{4}$ miles northward of Tongmi Point. In moderate weather the bay and its approaches are usually crowded with fishing boats.

Tongmi Point ($22^{\circ}45' N.$, $115^{\circ}49' E.$, *H. O. Chart 3200*) is the southern extremity of a promontory. The highest summit of this

promontory is Chino Peak, which is 432 feet high, and sharp and rocky. This conspicuous summit lies about 1 mile northwestward of Tongmi Point.

Shores.—Chino Reef, partly awash, extends about 600 yards from the shore in a position about $1\frac{1}{2}$ miles northwestward of Tongmi Point. A conspicuous block of granite stands at an elevation of 60 feet on the eastern shore of the bay in a position nearly 4 miles northward of Tongmi Point.

Kinsiang Point lies nearly $9\frac{1}{4}$ miles northwestward of Tongmi Point at the head of Hiechechin Bay. The eastern shore of the bay between Kinsiang Point and a point about $1\frac{1}{2}$ miles northwestward of Tongmi Point is indented by Chino Bay. The latter bay is encumbered by numerous detached rocks and shoals; many of these cannot be seen because of discolored water. Boats can land practically anywhere on the shore of Chino Bay during the northeast monsoon. Kinsiang Point is marked by a conspicuous hill 156 feet high.

The land within the head of Hiechechin Bay is flat and swampy. A river flows southward into the bay in a position about $2\frac{3}{4}$ miles northwestward of Kinsiang Point, and another in a position about $4\frac{1}{2}$ miles west-northwestward of the point.

Two ranges of hills rise within the northeastern shore of Hiechechin Bay. One range terminates westward in a well-defined summit, Round Mountain, which is 1,439 feet high and lies a short distance within Kinsiang Point. The other range terminates southward in Nipple Mountain, which is 948 feet high and lies nearly 5 miles eastward of Kinsiang Point. Mount Simpson, 1,773 feet high, is the highest summit on the western side of the bay; it lies about 10 miles north-northwestward of Chilang Point.

Paukshao Peninsula extends from the western shore of Hiechechin Bay. The northeastern extremity of the peninsula, Paukshao Point, is marked by a summit 201 feet high; the point is about $6\frac{1}{4}$ miles north-northeastward of Chilang Point. Paukshao Bay is formed by the northwestern side of Paukshao Peninsula and the shore of Hiechechin Bay northwestward of the peninsula. A large area of Paukshao Bay dries. It is encumbered by numerous rocks and islets.

Chilang Point, the southwestern point of the entrance to Hiechechin Bay, consists of red sand and rugged rock. A conspicuous boulder, 103 feet high, lies about $\frac{1}{4}$ mile northward of the point, and has on it a whitewashed mark. The land for some distance on either side of the point is of a remarkable red color, with numerous black mounds. A narrow, unnavigable channel separates Chilang Point from Chilang Rock, which is 110 feet high. **Chilang Point Light** (see Light List) is shown from a white circular stone tower, 66 feet high, situated on Chilang Rock.

Islets and dangers in Hiechechin Bay.—Siki, an islet 45 feet high, lies nearly $3\frac{1}{4}$ miles southwestward of Tongmi Point. The islet is rugged, and is marked by two granite hummocks. Simpson Rock, about $\frac{1}{2}$ mile northwestward of Siki, has over it a depth of 3 fathoms. A 6-fathom patch lies 1 mile southward of the islet. Vessels should not approach the islet closely.

Double Stone, East White Stone, West White Stone, and Yellow Stone, are remarkable precipitous rocks in Chino Bay. The southernmost, Yellow Stone, is 43 feet high, and lies about $4\frac{1}{2}$ miles southeastward of Kinsiang Point. All except Double Stone are conspicuous from the southward. Bassard Rock, Sarah Lucy Rocks, and Arnold Rock are dangerous pinnacles in Chino Bay lying within a distance of 2 miles of the southeastern point of the entrance to the bay.

The Glieng Islets form a group near the head of Paukshao Bay. The highest islet is 80 feet high.

White Rock lies about 600 yards offshore in a position nearly $1\frac{1}{2}$ miles south-southeastward of Paukshao Point. The ground around White Rock is foul.

The two Kinyu Islets, 87 and 60 feet high, respectively, lie close together in a position about 4 miles northeastward of Chilang Point. The larger and higher islet has a precipitous rocky summit.

Anchorage in Hiechechin Bay.—Anchorage, protected from all except southerly winds, can be taken in Hiechechin Bay. A position can be taken in the eastern or in the western portion according to the monsoon. Deep-draft vessels must anchor well out in the bay.

Vessels of moderate draft can secure good anchorage northwestward of Paukshao Point with shelter from westerly and southerly winds.

Vessels of light draft can secure good anchorage during the northeast monsoon in Chino Bay. The recommended position is with Yellow Stone bearing 280° and about 1,600 yards distant. Here the depths are 3 to 4 fathoms, and the bottom is mud. Vessels should approach this position by steering more than 0° for Yellow Stone until within about $\frac{3}{4}$ mile of the latter. A northeasterly course can then be steered for the anchorage. This approach is useful in avoiding Arnold Rock and Bassard Rock.

Vessels of light draft can also anchor in a position about $1\frac{1}{4}$ miles northwestward of Chino Peak during the northeast monsoon.

Vessels drawing not more than 10 feet can anchor about $\frac{1}{2}$ mile northwestward of Kinsiang Point.

Note that during the northeast monsoon a swell is felt throughout Hiechechin Bay.

THE COAST (*B. A. Chart 1962*) trends about $10\frac{3}{4}$ miles west-northwestward from Chilang Point to Tsiech Point. This section of

coast is irregular, and has off it a number of dangers. Tsiech Point is the eastern point of the entrance to Honghai Bay.

Chiapcheng, a walled town, lies about $1\frac{1}{4}$ miles inland in a position nearly $3\frac{1}{2}$ miles east-northeastward of Tsiech Point.

Anchorage westward of Chilang Point.—During the northeast monsoon there is good anchorage in a position about 400 yards westward of Chilang Point. The depths are 6 to 7 fathoms, and the bottom is sand and mud. Caution is necessary, however, as the depths decrease rapidly to the shore, and the tidal currents are strong. The conspicuous boulder, 103 feet high, close northward of Chilang Point bearing 44° , and in range with a smaller boulder southwestward of it, leads to the anchorage; the lighthouse on Chilang Rock bearing 132° , and in range with a whitewashed rock just below it, is a mark for letting go the anchor.

Off-lying islets and dangers.—Goat Island lies about $1\frac{1}{4}$ miles offshore in a position nearly 3 miles southeastward of Tsiech Point. Numerous dangers lie off the coast from a position abreast Goat Island to Chilang Point. Only the outermost of these dangers are described in the following paragraphs.

Flat Rock is about 10 feet high, and lies about $1\frac{1}{4}$ miles westward of Chilang Point. The channel between the rock and the coast to the northward is less than $\frac{3}{4}$ mile wide, and is encumbered with rocks above and below water.

Middle Reef is centered in a position about midway between Goat Island and Chilang Point. The reef is of small extent, and is awash. The channel between the reef and the coast is unsafe.

The Reef Islets are 35 to 40 feet high; they lie about 3 miles southeastward of Goat Island. Reefs surround the islets to a distance of 400 yards.

A rock above water and a breaking rock lie about 1 mile and $1\frac{1}{4}$ miles, respectively, eastward of Goat Island.

Goat Island Anchorage (*plan on H. O. Chart 2599*).—A rocky spit extends about $1\frac{1}{2}$ miles southward from a position on the coast about 2 miles eastward of Tsiech Point. Green Islet and several other small islets lie near the extremity of this spit; Goat Island lies just off the extremity of this spit. Goat Island attains a height of 175 feet. Foul, rocky ground extends about 1,200 yards southward from the island. A rock that just uncovers lies about $1\frac{1}{2}$ miles southwestward of the western extremity of the island.

Fairly sheltered anchorage can be taken during the northeast monsoon between Tsiech Point and Goat Island.

HONGHAI BAY (*B. A. Chart 1962*) is entered between Tsiech Point and Ross Head, about $19\frac{1}{2}$ miles westward. The shores of the bay are indented by numerous shallow inlets.

Honghai Bay and its approaches have not been completely surveyed; dangers in addition to those shown on the chart may exist. Caution is necessary in navigating northward of a line extending about 27 miles west-southwestward from Tsiech Point to Fokai Point. There is usually a long ground swell in the bay, and at night in fine weather the bay is usually crowded with fishing junks.

Strong tidal currents, setting to the northward or southward according as the tide is flooding or ebbing, have been observed when proceeding past Honghai Bay.

The shore of Honghai Bay northwestward of Tsiech Point is hilly. Taisami Mound, 2 miles northwestward of Tsiech Point, is an artificial mound, at an elevation of 970 feet, lying on the highest part of the hills. Taisami Head is an extremity about $3\frac{1}{2}$ miles northwestward of Tsiech Point.

Taisami Inlet (*plan on B. A. Chart 1962*) indents the eastern shore of Honghai Bay. A channel leading to the inlet has a least depth of $2\frac{1}{4}$ fathoms, and is about $\frac{1}{2}$ mile wide between sand banks on either side. The bank on the southern side has depths of less than 2 fathoms, and extends as far as $1\frac{1}{2}$ miles westward from the shore between Taisami Head and Fort Point, the southern point of the entrance to the inlet. A 5-foot patch lies just within the northwestern extremity of this bank. Fort Point is about 2 miles north-northeastward of Taisami Head. Entrance Hill, just within Fort Point, rises to a height of 247 feet. The bank on the northern side of the entrance channel has depths of 2 fathoms or less. Anlan Rocks lie near the outer edge of the latter bank in a position nearly $1\frac{1}{4}$ miles northwestward of Fort Point. Anlan Rocks dry.

Northward of Fort Point the depths in the channel increase to 4 fathoms and over, but the width decreases to about 300 yards. The depths off the southern shore of the inlet, as far as 1 mile within the entrance, are 3 to $6\frac{3}{4}$ fathoms.

Swabue (Taisami), a village on the northern side of the entrance, is marked by a church of occidental architecture. The village, in which is a post office, is connected to the general telephone system.

Shoal Bay indents the middle of the northern shore of Honghai Bay. The eastern point of the entrance, Club Point, is about 10 miles northwestward of Tsiech Point; the western point of the entrance, Mace Point, is about $2\frac{1}{2}$ miles westward of Club Point. The general depths in Shoal Bay are less than 2 fathoms; the depths in the entrance are $2\frac{1}{2}$ to 3 fathoms. A boat channel leads off northeastward from the bay to connect with Hiechechin Bay. A United States naval vessel reported (1941) that Shoal Bay affords protection from northerly winds; vessels intending to take advantage of this are advised to enter by passing close to Club Point, sounding constantly, and to anchor when a fishing village on the shore of the bay is sighted.

The shore of Honghai Bay trends about $9\frac{1}{2}$ miles southwestward from Mace Point to Ross Head, the western point of the entrance to the bay. Ross Peak lies about 1 mile within Ross Head. A river flows through this shore into the bay. The entrance to this river, about $7\frac{3}{4}$ miles westward of Mace Point, has off it a bar over which the depth is 6 feet.

Islands and dangers in Honghai Bay.—Honghai Island is 240 feet high, and lies about $11\frac{1}{4}$ miles west-northwestward of Tsiech Point. Two drying rocks lie about 600 yards south-southeastward of the southeastern extremity of the island. Some shelter from southerly winds can be had off the northern shore of the island in depths of 4 fathoms.

Hat Islet, about $2\frac{1}{2}$ miles westward of Honghai Island, is a peaked rock. Numerous detached rocks lie off the islet.

Inside Islet lies about $\frac{3}{4}$ mile off the head of Honghai Bay in a position about 5 miles northwestward of Honghai Island. Inside Islet attains a height of 460 feet. Detached rocks lie about 600 yards southwestward of the southern extremity of the islet. A rocky patch over which the depth is 6 feet lies about 800 yards eastward of the islet.

Anchorage in Honghai Bay.—In the northeast monsoon sheltered anchorage can be taken westward of Taisami Head. A long, heavy swell generally is experienced, however.

Tides.—The mean high water interval in Honghai Bay is 9h. 50m.; the mean range is 4.6 feet, and the spring range is 6.5 feet.

THE COAST (*H. O. Chart 3199*) trends about 12 miles south-southwestward from Ross Head to Fokai Point. Samchow Inlet is entered in a position about $3\frac{1}{2}$ miles southwestward of Ross Head. Fokai Point is the southeastern extremity of a promontory (for principal description see p. 538) connected to the mainland by a low, sandy isthmus.

Harlem Peak, 2,070 feet high, is a conspicuous summit lying within this section of coast in a position about $6\frac{1}{4}$ miles west-southwestward of Ross Head.

Samchow Inlet (*H. O. Chart 2226*).—Tung ching Chue, the northeastern point of the entrance to Samchow Inlet, rises to a summit, Tung ching Ling, 337 feet high. Tung pan Shan is the southwestern point of the entrance, and lies about $\frac{3}{4}$ mile south-southwestward of Tung ching Chue. Tung pan Shan is low and flat, except for a small hummock. Sihu (Entrance) Islet lies less than 400 yards eastward of Tung pan Shan. The islet is fringed by a narrow reef, and there are drying reefs between the islet and Tung pan Shan. An 18-foot patch lies about 100 yards northeastward of the eastern extremity of the islet. Tunghu (Coast) Islet lies about $\frac{3}{4}$ mile

eastward of Tung ching Chue. This islet is also fringed by a narrow reef, and in the channel between the islet and Tung ching Chue are drying reefs.

Wai Kia (Outer Bank) extends about $\frac{1}{2}$ mile southward from Tung ching Chue. Feihu Bank has a least known depth of 9 feet, and lies about $\frac{3}{4}$ mile southeastward of Tung ching Chue. These banks are rocky. Nei Kia (Inner Bank) lies a short distance within the entrance; the wider and deeper channel through the outer portion of the inlet lies off the eastern and northeastern sides of Nei Kia.

Within the entrance the inlet trends generally northwestward for about 1 mile from a position abreast Tung ching Chue to Tung Paotai and Si Paotai, points nearly abreast each other on the northern and southern sides, respectively, of the inlet. On each point are the ruins of a fort. Paihu Chow is an islet nearly 1 mile above these points. The inlet bifurcates at Paihu Chow; the channel trending northward is Samchow Reach, and the channel trending northwestward is Tachow Reach. A patch with a least depth of 16 feet lies about 200 yards east-northeastward of Paihu Chow.

Anchorage in Samchow Inlet.—Good anchorage can be taken in depths of 5 to 6 fathoms in a position about 700 yards below Paihu Chow.

Directions.—The following directions were followed in 1930, but it must be remembered that considerable change may have taken place in the banks near the entrance and within the inlet. It is advisable to enter at high water. Local knowledge is advisable; the tidal currents may attain a rate of 5 knots.

From a position about $\frac{1}{2}$ mile southeastward of Sihu Islet a vessel should steer for Tung ching Chue bearing 338° . A west-northwesterly course should subsequently be steered so as to pass fairly close north-eastward of Sihu Islet, remembering the 18-foot patch about 100 yards northeastward of that islet. A vessel can pass between Wai Kia and Nei Kia by keeping the summit of Sihu Islet bearing 179° astern. A midchannel course should be steered when past Nei Kia until Tung Paotai has been rounded. The existence of the 16-foot patch north-eastward of Si Paotai should be noted. A course of 323° for the summit of Paihu Chow should then be followed and anchorage taken when 700 yards from this islet.

Islets and dangers off the coast between Ross Head and Fokai Point.—Sunk Rock, over which the depth is less than 6 feet, lies about 3 miles south-southeastward of Ross Head. The rock often breaks. Mace Point bearing 53° , and open northwestward of Hat Islet, leads northwestward of this danger.

Single Rock lies about 4 miles eastward of Sunk Rock. Single Rock breaks at low water or when there is a heavy sea. A rock, over which

the depth is 2 fathoms, lies about $\frac{1}{2}$ mile northeastward of Single Rock.

Si ting, a rocky islet about 50 feet high, lies about $4\frac{1}{2}$ miles south-southeastward of Ross Head. Tung ting, an islet about $1\frac{1}{2}$ miles farther south-southeastward, is of about the same height as Si ting, and resembles the latter islet. Rocks above and below water lie off Tung ting; there are rocks as far as $\frac{1}{2}$ mile southward and southeastward of the islet.

A sunken rock lies about $1\frac{3}{4}$ miles offshore in a position about 5 miles south-southwestward of Ross Head.

Three rocky islets lie off the southern part of the sandy isthmus connecting the Fokai Point promontory to the mainland. A rock over which the depth is less than 6 feet lies about 600 yards north-northeastward of the northernmost islet in a position nearly $2\frac{1}{2}$ miles northward of Fokai Point. A reef awash is about $\frac{3}{4}$ mile east-northeastward of the same islet.

APPROACHES TO BIAS BAY (*H. O. Chart 3199*).—The approach to Bias Bay from the eastward leads between Fokai Point and Pedro Blanco, an outlying islet. Two rocks, Pauk Piah and Whale Rock, lie in this approach.

The approach from southward leads between Fokai Point and Teyi Point, about $16\frac{1}{2}$ miles west-southwestward of Fokai Point. The Tuniang Islands and Middle Rocks lie on the western side of this approach; Middle Rock, Mendoza Island and an islet, Tsinku, lie on the eastern side. The Tuniang Islands enclose Samun Road.

The coast on the northeastern side of the approach to Bias Bay, the section between Fokai Point and Bias Point, nearly 9 miles west-northwestward, is indented by Harlem Bay.

Fokai Point ($22^{\circ}33' N.$, $114^{\circ}55' E.$, *H. O. Chart 2216*) is the southeastern extremity of a promontory 670 feet high. From a distance on easterly or westerly bearings the promontory appears as an island. A fort stands on a hill, 393 feet high, near the southwestern extremity of the promontory. A signal station, consisting of a circular tower with a white mast nearby, is situated on the promontory in a position about 1 mile west-northwestward of Fokai Point. This tower is conspicuous on bearings between east and north; it is then on the skyline. The tower is obscured on bearings between north and west.



Mendoza Island.

Harlem Peak bearing
about 017° , 30 miles distant.

Fokai Point.

Fokai Point and adjacent coast from southward.
(Original dated 1845.)

Pauk Piah, a flat rock about 25 feet high, lies about $6\frac{1}{2}$ miles eastward of Fokai Point.

Whale Rock lies about $2\frac{1}{2}$ miles south-southwestward of Pauk Piah. The rock consists of two parts, and is awash. The sea sometimes breaks on Whale Rock; it is steep-to.

Pedro Blanco (Tai sing chan) is a rocky islet lying about $18\frac{1}{2}$ miles south-southeastward of Fokai Point. The islet has a white summit 130 feet high. On northerly bearings the islet appears double.



Pedro Blanco bearing 174° , $2\frac{1}{2}$ miles distant. (Original dated 1935.)

Mendoza Island lies about $2\frac{3}{4}$ miles southwestward of the southwestern extremity of the Fokai Point promontory. The island is 480 feet high, and has two peaks forming, from some directions, a saddle-shape. Shelter from southwesterly winds may be obtained off the northeastern side of the island. An islet lies close westward of Mendoza Island; the intervening channel is shallow and available to boats only.

Tsinku, an islet 167 feet high, lies about $\frac{3}{4}$ mile northward of Mendoza Island. A remarkable cleft near its middle marks Tsinku. The channel between the islet and Mendoza Island is navigable.

Middle Rock, 10 feet high, lies about 1,200 yards westward of the southwestern extremity of the Fokai Point promontory. Small vessels may pass on either side of the rock.

The Tuniang Islands and Samun Road (*plan on H. O. Chart 2216*).—Tuniang Island, the northernmost and largest of the Tuniang Islands, lies with its northern extremity about $2\frac{1}{4}$ miles south-southeastward of Teyi Point. The island is over 2 miles long in an east and west direction, and over 1 mile wide. A conical summit in its southern portion is 960 feet high. The northern and western shores of the island are indented. A fort, with some buildings close westward of it, lies on a point about 600 yards southward of the northwestern extremity of the island. Foul ground extends westward from this point as far as 400 yards. Some islets, with rocks and foul ground around them, lie within a distance of 1,800 yards westward of the northwestern extremity of Tuniang Island. Net Islet, the nearest, has a sugarloaf shape. Peak Rock, 80 feet high, lies about $\frac{1}{4}$ mile southwestward of Peak Islet, and appears as two islets connected by a single beach. About 800 yards northwestward of Peak Rock is a ledge of rocks near the edge of which are rocks always above water. The channel between Tuniang Island and Teyi Point is clear, with the exception of the dangers just mentioned.

Cone Islet and an islet close westward of it lie off the southeastern side of Tuniang Island.

Samun Island, 268 feet high near its southwestern extremity, is about $1\frac{1}{4}$ miles long in a northeast and southwest direction, and is about $\frac{1}{2}$ mile wide. The channel between the northwestern shore of the island and the southern extremity of Cone Islet is not quite 400 yards wide; the channel is clear, and has a depth of 8 fathoms.

Single Islet lies about $1\frac{3}{4}$ miles south-southeastward of Samun Island, and has a rounded summit 200 feet high. Akong Rock, a remarkable pyramid rock 100 feet high, lies about 1,200 yards northeastward of Single Islet; the intervening channel is deep. A rock with a depth of $2\frac{3}{4}$ fathoms over it lies about 1 mile northeastward of Single Islet; the depths around the rock are 13 fathoms.

Samun Road is an area southwestward of Cone Islet and between Tuniang Island and Samun Island.

Anchorage.—The best anchorage in the vicinity of the Tuniang Islands is in Samun Road. The recommended position is in depths of 7 to 8 fathoms westward of the southern extremity of Cone Islet. There is shelter from all except westerly and southwesterly winds. The holding ground is reported to be poor.

During southwesterly winds anchorage can be taken off the northern shore of Tuniang Island in depths of 9 to 10 fathoms, and also northeastward of Cone Islet in depths of 10 to 12 fathoms.

During the northeast monsoon junks anchor in depths of 9 fathoms southward of Net Islet and Peak Rock, abreast the fort on Tuniang Island.

Middle Rocks, drying about 5 feet, lie about $3\frac{3}{4}$ miles eastward of Teyi Point. A reef drying about 5 feet lies about 600 yards southwestward of Middle Rocks.

The coast forming the northeastern side of the approach to Bias Bay, between Fokai Point and Bias Point, is indented by Harlem Bay. The southeastern point of the entrance to this bay is a point nearly $1\frac{3}{4}$ miles westward of Fokai Point; the northwestern point, about $4\frac{1}{2}$ miles from the southeastern point, rises to a promontory formed by the southern end of a range of hills. On a point about 1 mile northward of the southeastern point of the entrance to Harlem Bay is a fort.

Hebe Islet, 70 feet high and flat-topped, lies about $\frac{1}{2}$ mile northwestward of the southeastern entrance point on the edge of a coastal bank. A ledge of drying rocks extends 600 yards northeastward from the islet, and a rocky patch with a depth of $3\frac{1}{2}$ fathoms over it lies about 600 yards southwestward of the islet.

Anchorage can be taken in any convenient depth northward of Hebe Islet in Harlem Bay during the northeast monsoon.

A vessel entering the bay from the eastward should round Fokai

Point at a distance of about $\frac{1}{2}$ mile. Large vessels should pass westward of Middle Rock, and must be careful to avoid the $3\frac{1}{2}$ -fathom patch southwestward of Hebe Islet.

Tidal currents off Bias Bay.—The tidal current off Bias Bay has been observed in April to set constantly westward; its rate, which did not exceed 1 knot, increased with the flood tidal current. When the monsoon drift-current recedes from the coast, tidal influences prevail, and the flood current is reported to set westward and the ebb eastward.

BIAS BAY (*H. O. Chart 2216*).—From its entrance between Bias Point and Teyi Point this bay extends northward and northeastward about 17 miles. The shores of the bay are irregular; Fanlokong Harbor, Dumbell Bay, and a large bay with Taipang Harbor at its head, are extensive indentations.

Vessels can anchor at various places in Bias Bay in either monsoon; the recommended typhoon anchorage is in Fanlokong Harbor. The bottom of the bay consists of mud.

A chain of islands fronts the western shore of Bias Bay; there are numerous islands off the eastern shore.

The northern part of Bias Bay, generally eastward of the island chain fronting the western shore, is thickly studded with fishing stakes. These stakes are connected one to another with strong cables, and make navigation dangerous, particularly at night. A clear passage may be found on the eastern side of the bay, adjacent to an island, Tsang Chow.

Eastern shore.—Bias Point ($22^{\circ}35' N.$, $114^{\circ}45' E.$, *H. O. Chart 2216*) is the southwestern extremity of a peninsula marked by three peaks, of which the easternmost and highest is 380 feet high. A rock 3 feet high lies at the outer end of a rocky ridge extending about 1,200 yards south-southwestward from Bias Point; a rock, 38 feet high, lies a short distance within the extremity of the ridge. Foul ground also extends about 500 yards westward from the point. A rock, over which the depth is 6 feet, lies about 500 yards offshore in a position nearly 1,300 yards eastward of Bias Point.

The shore close northward of Bias Point is indented by a bight; a sand patch on the shore of this bight and a factory chimney within the shore are both conspicuous.

Whaler Point lies on the eastern shore of Bias Bay about $4\frac{1}{4}$ miles north-northwestward of Bias Point. This section is fringed by a bank. Triple Islet, 147 feet high at its southern end, lies on the edge of this bank in a position nearly $2\frac{1}{2}$ miles north-northwestward of Bias Point. Station Peak is a conspicuous summit, 780 feet high, lying about 1 mile inland nearly midway between Bias Point and Whaler Point.

The eastern shore between Whaler Point and Buffalo Point, nearly $5\frac{1}{4}$ miles north-northeastward, is fronted by a bank. Tsang Chow, a flat-topped island 95 feet high but not conspicuous, lies about $\frac{1}{2}$ mile offshore on the outer edge of this bank in a position nearly 1 mile southwestward of Buffalo Point. This island lies in the approach to Fanlokong Harbor. The shore for a distance of 2 miles southward from a position abreast Tsang Chow is fringed by numerous sunken rocks. Some rocks above water lie off the western end of Tsang Chow; a narrow drying ridge of stones extends about 300 yards northeastward from the island. An islet, 64 feet high and marked (1907) by a conspicuous tree, lies about 300 yards southward of the island.

Within the eastern shore between Whaler Point and Buffalo Point are three conspicuous mountains. Mount Hewitt, the southernmost, is 1,916 feet high; Mount Bisbee is 1,989 feet high; Kaoao Shan is 1,739 feet high. There are numerous villages on these mountains; the intervening valleys are cultivated.

Fanlokong Harbor is entered between Buffalo Point and Tai pai tau, a point about 2 miles north-northwestward of Buffalo Point. The least depth in the fairway over a bar across the harbor entrance is $2\frac{3}{4}$ fathoms. The southeastern side of the harbor is fronted by a mud bank. A portion of the bank, as far as 600 yards from the shore, dries; the remainder, with depths less than 6 feet, extends as much as 400 yards farther. The drying portion of a mud bank at the head of the harbor is nearly $\frac{1}{2}$ mile wide; the portion with depths less than 6 feet is as much as 1 mile wide. The northwestern side of the harbor is fronted by a bank, 400 to 800 yards wide, with depths less than 6 feet. Tai pai tau, the northwestern point of the entrance, is high and rocky. A rock 4 feet high is one of several lying off the point. Port Reef, over which the depth is 4 feet, lies 900 yards southeastward of Tau pai tau.

Fanlokong Harbor is surrounded by hills. Within the southeastern shore are hills as high as 1,000 feet; Saochai Shan, 1,374 feet high, is a conspicuous summit within the northwestern shore.

The town of Fanlokong is at the head of the harbor. Many villages dot the cultivated plain in the vicinity.

The best typhoon anchorage in Bias Bay is said to be in Fanlokong Harbor.

Northern and northwestern shores of Bias Bay.—Wa shan tau is a prominent headland on the northern shore of Bias Bay. The headland attains a height of 360 feet and lies nearly 3 miles westward of Tai pai tau. The shore between the headland and the latter point is indented by a bight with a low, sandy shore. Sai Pai Rock, over which the depth is 5 feet, lies in the entrance to this bight in a position about 2 miles westward of Tau pai tau.

The northwestern shore of Bias Bay trends about $8\frac{1}{2}$ miles from Wa

shan tau to the hilly peninsula partially enclosing Dumbell Bay. Nipple Hill, 383 feet high, lies at the inner end of this peninsula. This section of shore is low and cultivated. North Peak, about $3\frac{1}{2}$ miles inland, is 2,537 feet high.

Potap Chow and Fu Chow are islets close off the northwestern shore of Bias Bay. Potap Chow is 85 feet high, and lies about 600 yards offshore in a position about $1\frac{3}{4}$ miles southwestward of Wa shan tau. The summit of Potap Chow is marked by a pagoda. Fu Chow is 130 feet high and lies nearly midway between Wa shan tau and Potap Chow. Fu Chow is connected with the shore of Bias Bay at low water.

Dumbell Bay has depths generally less than 3 fathoms. The entrance is between the southeastern extremity of the peninsula marked by Nipple Hill and a point about 3 miles south-southeastward. Big Island (p. 545) is close off the latter point. The northwestern shore of the bay is indented. The town of Pa long hu lies at the head of the bay.

Numerous islands lie in the approach to Dumbell Bay; these islands comprise approximately the northern half of the chain of islands lying off the western shore of Bias Bay. These islands are described on page 544. Hogsback Island lies close off the northwestern point of the entrance to Dumbell Bay. The island is 328 feet high. An islet, 107 feet high, is close off the eastern end of Hogsback Island. Dome Islet, 152 feet high, lies in Dumbell Bay in a position nearly $2\frac{1}{2}$ miles southwestward of Hogsback Island. South Islet is 168 feet high, and lies about $\frac{3}{4}$ mile southwestward of Dome Islet. There are numerous other islets in this group.

Western shore of Bias Bay.—The western shore of Bias Bay, between the southeastern point of the entrance to Dumbell Bay and Teyi Point, about $8\frac{3}{4}$ miles south-southeastward, is indented by a large bay. The shores of this bay are hilly; a summit, 2,338 feet high, lies nearly 2 miles within the northwestern shore, and Chiyung Shan, 2,810 feet high, lies nearly the same distance within the southwestern shore.

Taipang Harbor is an area at the head of this bay. A short distance within the northern point of the entrance to Taipang Harbor is a hill, Tsatlong Shan. A shoal, with depths of less than 3 fathoms, extends nearly 1 mile into the harbor from a position on the shore abreast Tsatlong Shan.

The southern shore of the harbor, between the southern point of the entrance and a point about 1 mile westward, is indented by two small bays. The points between which these bays are entered are bold and steep-to.

Taipang, a walled town, lies a short distance within the head of Taipang Harbor.

Taipang Harbor, although contracted, affords good shelter to vessels of medium draft except from easterly winds. Vessels should enter keeping the southern shore of the harbor fairly close abroad; vessels drawing more than 15 feet should not proceed farther than the western point of the inner small bay indenting the southern shore of the harbor.

Islands and dangers within Bias Bay.—Bate Island ($22^{\circ}35' N.$, $114^{\circ}43' E.$, *H. O. Chart 2216*), lies about $1\frac{1}{4}$ miles westward of Bias Point. The island is 293 feet high and wooded. The intervening channel has depths of $3\frac{3}{4}$ to 7 fathoms, but passage through it cannot be recommended; there are tide rips, and possibly undiscovered pinnacle rocks.

Little Bate Island, a bare rock 55 feet high, lies about 600 yards southeastward of Bate Island; the depths in the intervening channel are $4\frac{1}{2}$ to 8 fathoms. Foul ground extends as far as 300 yards from the northern end of the island; Maung pai, a rock awash, is at the extremity of this foul ground. Thornton Rock, 1 foot high, lies about 1,200 yards north-northeastward of the northern extremity of Bate Island; a pinnacle rock, with a depth of 1 fathom over it, lies about 620 yards farther northeastward.

The wreck of a vessel sunk in 1927 lies in a position nearly $2\frac{3}{4}$ miles north-northwestward of Bate Island.

Lokaup Island is the southernmost of the chain of islands fronting the western shore of Bias Bay. Lokaup Island attains a height of 330 feet in its southern portion. Pyramid Point is the southern extremity of the island, and off this point are several pointed rocks. Cliff Islet is the outermost of several islets lying within a distance of $\frac{1}{2}$ mile of the southwestern side of Lokaup Island. Flat (Cake) Islet lies close off the eastern side of the island. An islet, 172 feet high, lies about 600 yards eastward of the northern extremity of the island; Lokaup Rock, 4 feet high, is at the outer end of a reef extending as far as 800 yards from the same extremity. The Pillars, an islet 89 feet high, lies about $\frac{1}{2}$ mile northward of the 172-foot islet, and has two remarkable square pillars on its southern side. Harry Rock, over which the depth is $4\frac{1}{2}$ fathoms, lies about $\frac{1}{2}$ mile northward of The Pillars.

The Middle Group consists of six islets. The southernmost, Green Islet, is 262 feet high near its western end, and lies nearly 1 mile northwestward of The Pillars. Hat Rock lies close southwestward of Green Islet. A rock with a depth of $2\frac{1}{4}$ fathoms over it lies about 300 yards off the eastern end of the islet. Tree Islet, the northernmost of the group, is 117 feet high, and lies nearly $1\frac{3}{4}$ miles north-northeastward of Green Islet. The northwesternmost islet, Reef Islet, is 179 feet high, and lies about 1 mile northward of Green Islet. A rock

awash lies 600 yards northward of Reef Islet; a breaking reef lies nearly $\frac{1}{4}$ mile southeastward of the islet.

The Harbor Group consists of nine islets. The two southernmost, The Twins, are each 106 feet high, and lie close together in a position about 1,800 yards northward of Tree Islet. Shoal Islet, 236 feet high, lies about $\frac{1}{4}$ mile northeastward of The Twins. Rocky ground, over portions of which the depth is 3 feet, extends as far as 600 yards northwestward from Shoal Islet. Tree-a-top Islet is 97 feet high, and lies about $\frac{1}{4}$ mile westward of The Twins; Sugarloaf Islet, 320 feet high, lies about $\frac{1}{2}$ mile farther west-northwestward. Fairway Rocks lie nearly 1,200 yards southwestward of Tree-a-top Islet, and are awash. Narrow Islet, 281 feet high, lies with its southern extremity about 600 yards northward of Shoal Islet. A shoal extends nearly 1 mile in a west-northwesterly direction from a position nearly between Narrow Islet and Shoal Islet; a patch of $2\frac{1}{2}$ fathoms lies about 1 mile westward of the northern extremity of Narrow Islet.

Round Islet, 198 feet high, is nearly 500 yards north-northwestward of the northern extremity of Narrow Islet. Flat Rock, nearly awash and steep-to, lies about 200 yards northward of Round Islet. Cone Islet is 113 feet high, and lies nearly $\frac{3}{4}$ mile northwestward of Round Islet. Cone Islet is reef-fringed; the reef extends off the southern side as far as $\frac{1}{4}$ mile.

Big Island is about 1,200 yards west-northwestward of Sugarloaf Islet, and about the same distance northeastward of the southeastern point of the entrance to Dumbell Bay. Fisherman Rock, drying 3 feet, lies nearly in midchannel between the latter point and Big Island. North Tree Islet, 132 feet high, is close off the northern end of Big Island. North Rock, a flat, reef-fringed rock visible at low water, lies nearly 600 yards northward of North Tree Islet. Sand Cay, a low rock surrounded by sand, lies about 800 yards northwestward of Big Island.

Slope Islet, 173 feet high, lies about 1 mile northward of North Tree Islet. An area bounded westward by Slope Islet and North Rock and eastward by Round Islet and Cone Islet is encumbered by reefs on which are rocks above water.

Low Islet, 125 feet high, lies about $1\frac{1}{2}$ miles north-northeastward of Slope Islet. An islet 73 feet high lies close northwestward of Low Islet. Kai Pan Rock lies about 1 mile west-southwestward of Low Islet, and has over it a depth of less than 6 feet.

Dumbell Islet attains a height of 271 feet near its western end. It lies about $\frac{1}{2}$ mile eastward of Hogsback Island (p. 543), the island off the northwestern point of the entrance to Dumbell Bay. A low islet lies between Dumbell Islet and the 107-foot islet eastward of Hogsback Islet. The wreck of a vessel, a part of which is above water, lies $\frac{1}{2}$ mile southward of Dumbell Islet.

Sum Chow, an islet 250 feet high, lies about $\frac{3}{4}$ mile northward of Dumbell Islet. Spit Islet, 149 feet high, lies in the intervening channel. A rock with a depth of less than 6 feet lies close off the eastern end of Sum Chow.

Anchorage in Bias Bay.—Vessels can anchor anywhere in the eastern part of Bias Bay according to draft.

During the southwest monsoon vessels can anchor in the western part of the bay off Taipang Harbor in any required depth.

During the northeast monsoon vessels can anchor in a depth of about 6 fathoms about 1 mile westward of Triple Islet (p. 541). The wreck of the vessel sunk in 1927 must be noted in approaching this position.

Vessels can anchor on either side of Lokaup Island, according to the direction of the wind. In October 1935 a British naval vessel anchored with Pyramid Point bearing 125° and 1,050 yards distant. Here the depth was 7 fathoms, and the bottom was mud.

Tidal currents in Bias Bay.—The tidal currents turn at the times of high and low water; at springs the currents attain a rate of $\frac{3}{4}$ knot.

THE COAST (*H. O. Chart 3199*) trends about 8 miles southwestward from Teyi Point to Mirs Point. This section is the southeastern shore of a mountainous peninsula separating Bias Bay from Mirs Bay. The highest summit, Chiyung Shan, is 2,810 feet high, and lies about 3 miles within this shore nearly midway between Teyi Point and Mirs Point.

Coast.—The eastern point of the entrance to a sandy bay lies about $1\frac{3}{4}$ miles southwestward of Teyi Point. White Rock, which is conspicuous, is the outermost of a group of several rocks above water lying close offshore in a position about $\frac{1}{2}$ mile eastward of the eastern point of the entrance.

The eastern point of the entrance to another bay lies about $4\frac{1}{4}$ miles southwestward of Teyi Point. The entrance to this bay is nearly $1\frac{3}{4}$ miles wide. The northwestern shore of the bay is sandy. Coast Islet lies about 600 yards eastward of the western point of the entrance. A rock drying 2 feet lies in the bay in a position about 1,200 yards north-northeastward of Coast Islet.

A perforated point lies 1 mile southwestward of the western point of the entrance to the bay just mentioned. Some rocks above water lie about 400 yards off this point in a position nearly 1 mile eastward of Mirs Point.

Griffin Rock is 50 feet high, and lies close off Mirs Point.

MIRS BAY (*H. O. Chart 2217*).—Mirs Bay is entered between Mirs Point and Fung Head, nearly 6 miles west-southwestward. Within the entrance the bay widens. The eastern and northern shores are

indented slightly in several places. Pengchow Road is an area between the eastern shore of the bay and Peng Chow, an off-lying island.

The western shore of Mirs Bay is indented by numerous extensive inlets. Long Harbor is the southernmost inlet. Tolo Harbor is the head of another inlet reached through Tolo Channel. Wangchukkok Hoi, Double Haven, Crooked Harbor, and Starling Inlet are other inlets, or areas sheltered in part by islands off the western shore of Mirs Bay.

There are many well-sheltered anchorages, available to vessels of any draft, in Mirs Bay. The bay is a useful typhoon refuge. Long Harbor is considered the best anchorage in the bay.

The land in the vicinity of Mirs Bay is hilly. A summit, 2,284 feet high, of the Hunchback Hills, and Sharp Peak, 1,525 feet high, are conspicuous. Sharp Peak is nearly 2 miles northwestward of Fung Head; the 2,284-foot summit is about 7 miles west-southwestward of Sharp Peak. Chong Hill, 3,095 feet high, and North Cone, 2,472 feet high, lie nearly 2 miles within the northwestern shore of Mirs Bay. These two summits lie nearly $3\frac{3}{4}$ miles apart; both are conspicuous.

Vessels navigating in Mirs Bay must exercise caution, especially at night, to avoid the numerous fishing stakes. Many of the stakes are moored in depths of 6 to 9 fathoms; platforms are built on some of the stakes.

The more important of the many villages and towns in Mirs Bay are in communication with each other by launches.

Along the western shore of the approach to Mirs Bay the ebb tidal current sets southward. There is a strong in-draft into the bay with the flood current. Within Mirs Bay the tidal currents are almost inappreciable.

Eastern shore of Mirs Bay.—Mirs Point ($22^\circ 27' N.$, $114^\circ 30' E.$, *H. O. Chart 2217*) rises to an elevation of 1,284 feet. A beacon stands a short distance northwestward of the point.

A bay indents the eastern shore of Mirs Bay between a point about $\frac{1}{2}$ mile northwestward of Mirs Point and Hakngam Kok, a point about 1 mile farther northwestward. Near the head of this bay is a joss house; a conspicuous white boulder is close eastward of the joss house. Small vessels can secure shelter from northerly and easterly winds in this bay.

The shore between Hakngam Kok and the southern point of the entrance to a small bay about $3\frac{3}{4}$ miles northward is slightly indented. Numerous rocks, drying 1 to 5 feet, lie close off this section. There is a customhouse at the head of the small bay; the village of Namu stands on the southern shore of the bay. A rock 15 feet high lies about 200 yards off the shore abreast Namu; a rock 50 feet high lies nearly $\frac{1}{2}$ mile westward of this rock. A shoal with a depth of $4\frac{1}{2}$

fathoms at its southern end lies about 800 yards westward of the 50-foot rock.

The northwestern point of the entrance to a small bay close northward of the bay just mentioned rises steeply in a north-northeasterly direction to East Cone, a remarkable peak, 745 feet high. The village of Siu tau sha is on the northern shore of the bay marked by East Cone. The head of the bay consists of a low isthmus separating Mirs Bay from Taipung Harbor to the eastward.

Albion Point is about 2 miles northwestward of the point marked by East Cone. The intervening shore forms a bight, at the head of which is a village, Tai O. A peaked rock, 40 feet high, lies within the bight in a position about 1,200 yards west-northwestward of East Cone.

Pengchow Road.—Pengchow Road is an area between the eastern shore of Mirs Bay and the island, Peng Chow. The island lies with its northern extremity about 1 mile south-southwestward of Albion Point. The island is about 1 mile long in a northwest and southeast direction, and is over $\frac{1}{4}$ mile wide. The highest point, 138 feet high, is near the southeastern end of the island. The cliffy southern and northwestern sides of the island are fringed by a reef about 200 yards wide. The depths in places as far as 400 yards off the southern shore of the island are less than 5 fathoms; a detached patch with a depth of 4 fathoms lies about 600 yards off the same shore. A shoal with depths of less than 5 fathoms extends as far as 600 yards from the eastern shore of the island. A rock, awash, lies about 200 yards northward of the eastern extremity of the island. A wreck lies sunk in a depth of 5 fathoms in a position nearly 250 yards southeastward of the northern extremity of Peng Chow.

There is good anchorage in Pengchow Road during the northeast monsoon. The depths are 7 fathoms. The area is, however, reported to be considerably obstructed by fishing stakes.

Northern shore of Mirs Bay.—A bay indents the northern shore of Mirs Bay between Albion Point and a point about 6 miles west-northwestward. A large building stands on the eastern shore of this bay in a position about $\frac{3}{4}$ mile northward of Albion Point. Near the building is a flagstaff. Shauechung, a village marked by a conspicuous customhouse, is at the head of the bay in a position nearly 3 miles north-northwestward of Albion Point. The village of Kai chung stands at the head of a small inlet indenting the shore of the bay in a position about $1\frac{3}{4}$ miles northeastward of the northwestern point of the entrance. A flagstaff is near Kai chung.

Two bights, separated from each other by a projection, indent the northern shore of Mirs Bay between the northwestern point of the entrance to the bay just mentioned and a prominent point about 2 miles west-southwestward. Peak Rock, 63 feet high, lies in the

approach to the western bight. Drying rocks and sunken rocks surround Peak Rock.

Western shore of Mirs Bay from Fung Head to Boulder Point.—Fung Head ($22^{\circ}25' N.$, $114^{\circ}24' E.$, *H. O. Chart 2217*), the southwestern point of the entrance to Mirs Bay, is 341 feet high. The headland is rocky and steep-to. Several rocks, from 3 to 50 feet high, lie close off it.

Bate Head lies about $1\frac{1}{2}$ miles northward of Fung Head. A rock 69 feet high lies close off Bate Head; a rock 37 feet high lies about 200 yards southward of the 69-foot rock.

A bay indents the western shore of Mirs Bay between Bate Head and a point about 1,200 yards west-northwestward of the headland, off which are two rocks each 30 feet high. The shore between the latter point and a point about $1\frac{1}{2}$ miles west-northwestward is indented by another bay. Foul ground extends from the southern shore of this bay as far as 700 yards in places; a $2\frac{1}{4}$ -fathom patch lies in the northwestern approach to the bay in a position about $\frac{1}{2}$ mile north-northeastward of the northwestern point of the entrance. Nam tsia is a village at the head of this bay. During southerly winds vessels can anchor off the village in a depth of 8 fathoms, or close in according to draft.

Boulder Point, the northwestern extremity of a peninsula, rises to an elevation of 413 feet. The point is about $1\frac{1}{2}$ miles north-northwestward of Nam tsia.

Islets and dangers in the entrance to Mirs Bay.—She k n gow Chow (Gau tow), a rocky islet 86 feet high, lies nearly in the middle of the fairway through the entrance to Mirs Bay in a position about $3\frac{1}{2}$ miles north-northeastward of Fung Head.

Breaker Reef lies about $\frac{1}{2}$ mile southwestward of Shekngow Chow. The middle portion of Breaker Reef dries 5 feet, and generally breaks. A rock awash is on the northwestern end of the reef; a patch of 4 $\frac{1}{2}$ fathoms lies near the southeastern end of the reef.

Wong mao Chow (South Gau), an islet 60 feet high, is about $\frac{3}{4}$ mile north-northwestward of Bate Head. Foul ground encircling the islet extends as far as 400 yards from the western side.

HARBORS WITHIN MIRS BAY (*H. O. Chart 2217*).—Long Harbor is the harbor nearest the southwestern point of the entrance to Mirs Bay. The principal entrance to the harbor, between Grass Island and Titow Peninsula, can be approached by way of North Channel or Middle Channel. South Channel also leads to Long Harbor, but the fairway through the latter channel is narrow.

Channels leading to Long Harbor.—South Channel (*H. O. Chart 2301*) lies between Boulder Point and the southern end of Grass Island. Shoals extending toward the center of the channel leave a fairway barely 100 yards wide; the least depth is $3\frac{1}{4}$ fathoms. A rock drying

1 foot is on the northern side of the channel in a position about 150 yards south-southeastward of the southern extremity of Grass Island. The latter island is about $1\frac{1}{4}$ miles long in a north and south direction, and is over $\frac{1}{2}$ mile wide. Wintz Hill, in the northern portion of the island, is 401 feet high. Fishing stakes and nets, close together, extend eastward from the southern portion of the island as far as Wong mao Chow.

Middle Channel lies between Grass Island and Port Island. The channel is about 1,200 yards wide; the fairway is deep. Port Island (Chak Chow) is about $\frac{1}{2}$ mile long in a north and south direction, and is over 700 yards wide. A hill in the northern portion of the island is 422 feet high. A narrow ledge marked by pinnacle rocks extends as far as 250 yards northeastward from the northeastern extremity of Port Island. Channel Rock (Sam Pai) lies on the southern side of Middle Channel in a position about 600 yards north-northeastward of the northeastern extremity of Grass Island. Channel Rock is awash at high water and generally breaks. The northern summit of Harbor Island bearing 252° , and in range with a large boulder just off Gruff Head, leads through Middle Channel between Port Island and Channel Rock. Kong Chow (North Gau) is a group of islets and rocks in the southeastern approach to Middle Channel. The largest and highest islet, 111 feet high, is steep and black, and lies about 600 yards eastward of the northeastern extremity of Grass Island. A reef, on which are drying rocks, extends southwestward from Kong Chow to Grass Island, and makes the intervening channel unsafe. Waterwitch Rock lies about $\frac{1}{4}$ mile southeastward of the southeasternmost islet of Kong Chow, and has over it a depth of $1\frac{3}{4}$ fathoms. Bluff Head bearing 304° , and in range with the southern extremity of Port Island, leads about 400 yards northeastward of Waterwitch Rock, and close northeastward of Channel Rock. Bate Head bearing 160° , and open northeastward of Wong mao Chow, leads northeastward of Waterwitch Rock.

North Channel is about $1\frac{1}{4}$ miles wide between the western side of Port Island and Bluff Head. There are numerous fishing stakes in the approach to North Channel from the northeastward. The depths in the channel are 9 to 10 fathoms. North Channel connects with Tolo Channel to the southwestward.

Bluff Head is the northeastern extremity of a hilly peninsula with peaks from 500 to 900 feet high. A summit 661 feet high, about 1 mile within the extremity of the peninsula, is marked by a **beacon**; another beacon, in a ruined condition, stands on the extremity.

Long Harbor.—Titow Peninsula, which forms the western side of the outer portion of Long Harbor, is hilly. Goliath Hill, in the south central portion, is 506 feet high. Ocean Point (Sam mau Shak), the northern extremity of the peninsula, is the western point of the

entrance to Long Harbor; the western extremity of Grass Island is the eastern point of the entrance.

The southern end of Long Harbor consists of West Arm and East Arm, which lie westward and eastward, respectively, of a projection terminating in Stokes Point. The head of each of these arms is shallow. Long Hill, about $\frac{1}{2}$ mile southward of Stokes Point, is 530 feet high.

White Cove is an indentation in the northwestern shore of Long Harbor.

Le Mottee Shoal, in the outer eastern portion of Long Harbor, has over its steep-to western edge a depth of 2 fathoms. The shoal forms the outer portion of a spit extending about 350 yards westward from the shore in a position about $\frac{1}{4}$ mile south-southeastward of the western extremity of Grass Island. The depths elsewhere on the spit are less than 5 fathoms. Junk Rock has over it a depth of 4 feet. The rock lies at the outer extremity of a spit extending about 300 yards southwestward from the western shore of Grass Island in a position nearly 1,200 yards south-southeastward of the western extremity of the island. The general depths on the spit are less than 5 fathoms. Phillimore Rock, over which the depth is $4\frac{1}{2}$ fathoms, lies on the western side of Long Harbor in a position nearly $\frac{1}{2}$ mile south-southeastward of Ocean Point, and about 250 yards offshore. Warburg Rock, over which the depth is $4\frac{3}{4}$ fathoms, lies in the fairway in a position about 1,800 yards southward of the western extremity of Grass Island. The latter extremity bearing 5° , and in range with the western extremity of Port Island, leads less than 200 yards westward of Warburg Rock. A shoal, over which the depth is $2\frac{1}{2}$ fathoms, lies about 200 yards off the western point of the entrance to White Cove.

Long Harbor affords good anchorage, in depths of 5 to 8 fathoms. With northerly winds, however, a considerable northerly swell sets in.

Fresh provisions may be obtained in limited quantities in several villages on the shores of Long Harbor.

Jones Cove.—The southwestern shore of Mirs Bay is indented by two inlets between Ocean Point and Gruff Head. The latter lies nearly $1\frac{1}{4}$ miles westward of Ocean Point. The eastern inlet, Jones Cove, is separated from the western inlet by a projection from which extends a shallow spit. The spit is about 1,200 yards long, and has on it several islets and rocks. The outermost rock, Chu ma Pai, is 2 feet high, and lies in a position about 1,100 yards northwestward of Ocean Point. A rock drying 7 feet lies close southwestward of Chu ma Pai. Fung Chow, an islet 60 feet high, is the easternmost islet on the spit, and lies nearly 900 yards west-northwestward of Ocean Point. Flat Islet, the largest islet on the spit, is 95 feet high, and lies close westward of Fung Chow. A rock, 27 feet high, lies close

southwestward of Flat Islet; an islet, 80 feet high, lies between Flat Islet and the mainland.

On the eastern side of the entrance to Jones Cove is Datum Rock. This rock dries 7 feet, and lies close off Joss House Point, the northwestern extremity of Titow Peninsula. The eastern shore of Jones Cove is indented by a bight between Joss House Point and Flynn Point, about $\frac{1}{2}$ mile southward. A rock drying 3 feet lies nearly 150 yards west-southwestward of Flynn Point. Tide Pole Point is on the western shore of Jones Cove in a position about 800 yards southwestward of Joss House Point. Hoi ha is a village at the head of Jones Cove.

The depths in the entrance to Jones Cove are 8 fathoms. The depths decrease gradually to the head, which partly dries. During northerly winds the cove is open to a considerable northerly swell.

Tolo Channel.—Tolo Channel can be approached by way of North Channel or by Middle Channel. The channel is entered between Gruff Head and Bluff Head (Wongchuk Kok), about 2 miles north-northeastward. The latter headland terminates seaward in cliffs 40 feet high, and is fringed by reef.

The northwestern side of Tolo Channel is formed by two peninsulas; the northeastern peninsula terminates in Bluff Head, and the southwestern peninsula terminates in a point, about 162 feet high, lying about 5 miles southwestward of Bluff Head. There are two small indentations in this side of Tolo Channel. Harbor Island lies close southwestward of the extremity of the southwestern peninsula, and is hilly; the highest of several peaks, 345 feet high, is in about the center of the island.

The southwestern side of Tolo Channel between Gruff Head and a point about $3\frac{1}{4}$ miles southwestward of the headland is indented by two small bays, separated one from the other by a projection off which is shoal water. Three Fathoms Cove (Samchung A) indents the southwestern side of the channel in a direction southeastward of Harbor Island. The depths in this cove are everywhere less than 5 fathoms. Sigan, an islet 29 feet high, is the northern of two islets each lying about 200 yards off the western shore of Three Fathoms Cove. The southern islet is 130 feet high. White Head (Tautau Jau), 307 feet high, is the extremity of a peninsula forming the southwestern end of the southwestern side of Tolo Channel. The headland is nearly $1\frac{1}{2}$ miles westward of the western point of the entrance to Three Fathoms Cove.

The dangers in Tolo Channel consist of Knob Reef, Flat Reef, and Bush Reef. Knob Reef lies about 600 yards northward of the projection separating the two small bays on the southwestern side of Tolo Channel, and about 2 miles southwestward of Gruff Head. Rocks 4 to 15 feet high mark the western edge of Knob Reef. Flat

Reef lies about 600 yards southwestward of Knob Reef; the depths between the two reefs are uneven. Flat Reef dries 5 to 6 feet; a rock, 3 feet high, rises from the reef. Bush Reef (Miau) lies in mid-channel in a position about 700 yards southeastward of Harbor Island. The reef is 2 feet high.

The channel passing northwestward of these dangers is wider than the channel to the southeastward, and is to be preferred accordingly. The depths between Bush Reef and Harbor Island were reported (1928) to be less than charted.

Tolo Harbor.—Tolo Harbor is entered between White Head and the southwestern extremity of Harbor Island. The depths in the entrance are 6 to 9 fathoms, and the depths decrease gradually westward toward the head of the harbor; the head of the harbor dries as far out as 1 mile. Taipo, a settlement including a police station and other buildings, lies on the southern side of the head of Tolo Harbor. The settlement is connected with the railroad system. Island House, a conspicuous red and white building with a flagstaff nearby, stands on a small island, 90 feet high. This island lies close off the southern shore near the head of the harbor in a position nearly 800 yards eastward of the police station in Taipo. The island is connected to the shore by a causeway. A rock, over which the depth is 6 feet, lies about 350 yards eastward of the island.

A **mooring buoy** is close off the outer end of a stone pier extending about 200 yards from the southern shore near the head of Tolo Harbor, in a position about 750 yards southeastward of the island marked by Island House. The pier has a reported depth of 2 fathoms at its head. The railroad station for Taipo is close westward of the foot of the pier. A bridge, across which the railroad crosses a small bay eastward of the stone pier, is conspicuous. Supplementary storm signals are displayed on the flagstaff near Island House when local storm signals are displayed at Hong Kong.

Several bays indent the shores of Tolo Harbor; Tide Cove is on the southern side of the harbor, and Plover Cove is on the northeastern side. Center Island, 80 feet high, lies in the fairway through Tolo Harbor in a position nearly $1\frac{1}{2}$ miles southwestward of Harbor Island. Nokot Chow, an island 373 feet high and much larger than Center Island, lies westward of Harbor Island; the intervening channel is about 1,200 yards wide, and leads to Plover Cove. Another island is connected eastward to Nokot Chow by a shoal, and westward to the mainland by a drying bank.

Tide Cove is entered between the western extremity of the peninsula terminating in White Head and a point about $1\frac{1}{2}$ miles southwestward. The eastern side of the entrance was reported (1936) to be obstructed by fishing stakes. The depths near the entrance are 4 to $4\frac{1}{2}$ fathoms,

and the depths decrease gradually toward the head. A rock drying 4 feet lies about 2 miles southwestward of the eastern entrance point of the cove and abreast a waterfall on the western shore of the cove. A peninsula, on the northern end of which is a police station, extends from the head of Tide Cove.

Plover Cove trends about 3 miles northeastward from its entrance between Nokot Chow and Harbor Island. The western shore of the cove is indented by a bight with drying mud flats off its northern and western sides. Yeung Chow is an islet in the center of this bight in a position nearly $\frac{1}{2}$ mile west-northwestward of the northern extremity of Nokot Chow. Another bight indents the northwestern shore of Plover Cove. A small stream flows through a drying bank of mud and stones at the head of the latter bight. Wangchung, a village off which are some jetties, lies on the western side of the mouth of this stream.

A rock 9 feet high and a rock 8 feet high lie near each other in a position about $\frac{1}{4}$ miles north-northeastward of the northern extremity of Nokot Chow, and about 600 yards off the western shore of the bight. A rock, over which the depth is $1\frac{1}{2}$ fathoms, lies about 400 yards south-southwestward of the 9-foot rock. A patch drying 4 feet lies close off the eastern point of the entrance to the bight. A small peninsula is at the head of Plover Cove. A rocky patch drying 1 to 5 feet lies about 300 yards off the southwestern end of this peninsula.

Anchorage in Tolo Harbor.—Vessels can anchor in Tide Cove in depths of 3 to 4 fathoms with shelter from all winds.

There is also good anchorage in Plover Cove. Note that in 1936 the cove was reported to be somewhat obstructed by fishing stakes.

An anchorage area in Tolo Harbor has been provided for vessels laden with dangerous cargo. The eastern limit of the area is a line drawn in a 0° - 180° direction through Bush Reef from the northern shore of Plover Cove to the southern shore of Tolo Channel; the western limit is a line drawn in a 353° - 173° direction tangent to the northeastern extremity of Nokot Chow.

Wangchukkok Hoi ($22^{\circ}31' N.$, $114^{\circ}20' E.$, *H. O. Chart 2336*).—This inlet trends about $1\frac{1}{2}$ miles west-southwestward from its entrance between Bluff Head and Mit kok Tsui, the eastern extremity of Double Island. The depths in Wangchukkok Hoi decrease gradually from 9 fathoms in the entrance to about $5\frac{1}{4}$ fathoms at the head of the inlet. The northwestern side of Wangchukkok Hoi consists of the two portions of Double Island, Tungwan To to the northeastward and Taitso To to the southwestward. These portions are connected by a narrow isthmus which forms the head of Wang Wan. The latter bay is entered between Wang wan Tsui and Chak u Pai. Chak u Pai is a reef extending about 100 yards offshore, and drying 6 feet; the depths as far as 100 yards southward of the extremity of the reef are less

than 5 fathoms. The southeastern side of Wangchukkok Hoi is formed by the peninsula terminating in Bluff Head. U Pai, a rock 2 feet high, is close off this shore in a position about $\frac{1}{4}$ mile south-southeastward of Wang wan Tsui. Ucheuk tsai, an islet 96 feet high, lies in the entrance to a shallow cove near the head of Wangchukkok Hoi.

A channel, Kang Mun, leads northwestward from the head of Wangchukkok Hoi to the head of Double Haven.

Good anchorage can be had in Wangchukkok Hoi; depths of 6 to 8 fathoms are available over a bottom of mud.

Double Haven.—This harbor is almost completely landlocked, and is one of the best anchorages in Mirs Bay. The bottom consists of mud. The shores of the harbor are extensively indented; there are numerous islets and dangers within it.

Several channels lead into Double Haven. The entrance from southeastward, Kang Mun, is a narrow boat passage between the southwestern shore of Mirs Bay and the southwestern shore of Taitso To. Chut Mun is a channel trending northwestward into Double Haven between the southwestern side of Lokwaiwan To (for principal description see p. 556) and the northeastern side of Tungwan To. The least depth in the fairway is $3\frac{1}{2}$ fathoms. The fairway narrows to a width of nearly 100 yards abreast Ku lun Shek (Unicorn Point), close off which is a peaked rock, 22 feet high. Ku lun Shek is on the southwestern side of Chut Mun in a position nearly 1,250 yards northwestward of Mit kok Tsui. Deep Pass trends southwestward into Double Haven between the northwestern shore of Lokwaiwan To and the southeastern shores of the islands Tuimui Chow and Crooked Island. The clear, deep fairway is over 200 yards wide. Cock's Head Rock, over which the depth is $3\frac{3}{4}$ fathoms, lies in the approach to Deep Pass from the northeastward in a position about 650 yards eastward of Kaikung Tow (Peaked Head), the eastern extremity of Crooked Island. Song To (Round Islet), 203 feet high, lies in the approach to Deep Pass from the eastward in a position nearly 1 mile southeastward of Kaikung Tow. Tsing Chow La is a channel trending southeastward into Double Haven from Crooked Harbor (p. 556.)

The principal islets and dangers in Double Haven are Fu yung Cheuk, Fu yung cheuk Tow, Middle Ground, Horley Rock, Snake Island, Woodman Reef, Yat tze tu, and Hung Pai. Fu yung Cheuk, a reef-fringed islet 125 feet high and the largest in the harbor, is connected to the western shore of the harbor by a short, shallow bank. Fu yung cheuk Tow is the shoal extremity of a spit extending about 400 yards southeastward from Fu yung Cheuk, and is marked by a rock, drying 4 feet, on its western edge. Middle Ground is a shoal patch centered about 400 yards northeastward of Fu yung Cheuk. The least depth on Middle Ground, over a rock near its western end,

is 1 fathom. Horley Rock, on the southeastern side of Double Haven in a position nearly 1,800 yards east-southeastward of Fu yung Cheuk, has over it a depth of 5 feet. Horley Rock is about 250 yards offshore. Snake Island, 40 feet high, is close off the southern shore of Double Haven in a position nearly $\frac{3}{4}$ mile southeastward of Fu yung Cheuk. Woodman Reef, over which the least depth is 2 feet, is the outer extremity of a spit extending about 300 yards north-northwestward from Snake Island; the depths over the spit are less than 5 fathoms. A detached patch with a least depth of $3\frac{1}{2}$ fathoms lies close northeastward of Woodman Reef. Yat tze tu, a rock 20 feet high, lies near the extremity of a reef extending about 200 yards northward from the northwestern extremity of Taitso To. The latter extremity is 30 feet high. Hung Pai, a rock 12 feet high, is 600 yards south-southwestward of Yat tze tu. Kang Mun, connecting Double Haven with Wangchukkok Hoi, is entered from the northwestward between Yat tze tu and Hung Pai.

There is good anchorage in Double Haven in depths of 7 fathoms over a bottom of mud.

Crescent Cove.—This inlet indents the northern shore of Lokwaiwan To to a distance of nearly $\frac{1}{2}$ mile. Lokwaiwan To (Crescent Island), nearly $\frac{3}{4}$ mile long and $\frac{3}{4}$ mile wide, attains a height of 471 feet near its northwestern extremity. Several rocks, from 4 to 16 feet high, rise from a shoal extending as far as 200 yards from the western shore of Crescent Cove near its head. A large portion of Crescent Cove has depths of 7 or 8 fathoms.

Appui Tong.—This inlet indents the southeastern shore of Crooked Island. The eastern point of the entrance to the inlet is Kaikung Tow, the eastern extremity of Crooked Island; the western point of the entrance, about 1 mile southwestward of Kaikung Tow, is also the northwestern point of the entrance to Deep Pass. Tuimui Chow, an island 358 feet high near its center, lies close off the latter point and in the entrance to Appui Tong. A reef drying 6 feet extends about 300 yards northeastward from Tuimui Chow, and terminates in Wongnai Chow, an islet 67 feet high.

Crooked Harbor.—This harbor, a good anchorage, is entered from the southeastward by way of a channel, Tsing Chow La (p. 555), connecting with Double Haven. Crooked Harbor is entered from the northward between North Point (Chek kok Tow) the northwestern extremity of Crooked Island, and Sam pau po Kok, a small peninsula, 111 feet high, extending northeastward from the southwestern shore of Mirs Bay. The depths in the entrance to Crooked Harbor are 7 to 8 fathoms, and the depths decrease gradually to the head. Several islets rise from a shoal bank, with depths less than 3 fathoms, trending irregularly northeastward from Sam pau po Kok. Robinson Island (Ap Cheuk), the outermost, attains a height of 86 feet near its south-

eastern extremity; its northwestern extremity is marked by a natural arch. Robinson Island lies about 1,100 yards northeastward of Sam pau po Kok. A reef drying 6 feet extends a short distance southwestward from the southwestern extremity of Robinson Island. A detached 3-fathom patch lies about 150 yards southward of the extremity of the reef. The southern end of a detached shoal close westward of Robinson Island is marked by a rock drying 5 feet. Saiap Cheuk, an islet 45 feet high, lies about 350 yards northward of Sam pau po Kok. Hoplo Chow, an islet 17 feet high, lies about midway between Saiap Cheuk and the northwestern extremity of Robinson Island.

There are numerous islets and dangers within Crooked Harbor. Lochi Pai, a rock 1 foot high, and another rock, 2 feet high, lie at the eastern and western ends, respectively, of a detached shoal close eastward of Sam pau po Kok. Cheungshok Tsui, an islet 157 feet high, lies near the extremity of a drying bank extending a short distance from the shore close southward of Sam pau po Kok. Leiu Cheuk, an islet 82 feet high, lies about $\frac{1}{4}$ mile southeastward of Cheungshok Tsui and about 350 yards off the western shore of Crooked Harbor. Muitau Cheuk, an islet 60 feet high, lies about 400 yards south-southeastward of Leiu Cheuk, and is connected with Pak Kok, to the southward, by a shoal from which rise several rocks 2 feet high. Pak Kok is a point on the western shore of Crooked Harbor. Shauki Pai, Fungcheuk Chow, Yan Chow, and Muntai Pai, are islets and rocks lying near the head of Crooked Harbor, on or near a line joining Pak Kok and Liu ko Ngam (Blackbird Point), a point on the shore of Crooked Harbor about 1 mile southeastward of Pak Kok. Table Island (Tsing Cheuk), an islet 50 feet high, lies a short distance eastward of this group, on the western side of the approach to Tsing Chow La (p. 555) from the northwestward. The islets and dangers described in this paragraph lie off the western shore of Crooked Harbor, which is extensively indented.

The eastern shore of Crooked Harbor is indented by two bays, Apchau Hoi and Sam chung Wan. The northern bay, Apchau Hoi, is separated from the other by a projection, Oshi Kok, which attains a height of 173 feet. Kat O, a village, lies near the head of Apchau Hoi.

There is good anchorage in Crooked Harbor; depths of 6 to 7 fathoms are available over a bottom of mud.

Fung Yung Wo.—This inlet leads about 700 yards southwestward from the southwestern side of Tsing Chow La, the channel connecting Crooked Harbor with Double Haven. The channel is about 700 yards wide between Liu ko Ngam and Sandy Point (Pakshatau Tsui), the southwestern extremity of Crooked Island, to the northeastward. Liu ko Ngam is the northwestern point of the entrance to Fung Yung Wo; Sz ngam tau Kong, about 600 yards southeastward, is the

southeastern point of the entrance. The depths in the inlet decrease gradually from $6\frac{1}{2}$ fathoms in the entrance to 5 fathoms quite near the head.

Luk tsz tun, an islet 9 feet high, lies close northwestward of Sz ngam tau Kong; Yuen tze Shek, a reef-fringed islet 34 feet high, lies about 200 yards northeastward of the point. A patch, from which rise rocks drying 3 to 7 feet, lies close southward of Yuen tze Shek.

Foul ground extends as far as 200 yards southward from Sandy Point. Village Rock lies about 700 yards east-southeastward of the latter point, and dries 6 feet. Village Rock forms the southern end of a reef projecting from the southern side of Crooked Island.

Starling Inlet.—The approach to Starling Inlet from the eastward trends between North Point, the northwestern extremity of Crooked Island, and a prominent point on the northern shore of Mirs Bay lying about $1\frac{3}{4}$ miles north-northeastward. Young Hebe Shoal, over which the least depth is 3 fathoms, lies in the approach, near the eastern edge of a bank, with general depths of 5 fathoms, in a position about 1,800 yards northward of North Point. Imtin, a town in which there is a customhouse, is on the shore on the northwestern side of the approach to Starling Inlet in a position about $2\frac{1}{4}$ miles north-northwestward of North Point. Three detached patches, each of 5 fathoms, lie about $\frac{1}{2}$ mile off the shore near Imtin, near the outer edge of a bank with depths less than 5 fathoms.

Starling Inlet is entered between Ledge Point (Cheung pai Tow) and a point on the northwestern shore of Mirs Bay lying about $1\frac{1}{2}$ miles northwestward of Ledge Point. Both these points are on the shore of Mirs Bay. The depths in the entrance are about $4\frac{1}{2}$ fathoms, and the depths decrease gradually to the shallow head of the bay.

The southern shore of the inlet is indented between Ledge Point and a point about 1,400 yards westward. Ah kung Tsui, an islet 52 feet high, lies close off the latter point. A reef, drying 3 to 6 feet, lies close off the southeastern side of the inlet in a position nearly 1,700 yards south-southwestward of Ah kung Tsui.

The town of Shataukok lies on the northwestern shore of Starling Inlet in a position nearly 1,800 yards west-southwestward of Ah kung Tsui. The outer edge of a bank of drying stones, 400 yards wide off the shore abreast Shataukok, recedes shoreward north-northeastward of Shataukok, and ends about 1 mile distant from the town. A customhouse with a conspicuous flagstaff is located in the town; in the northern end of the town is a conspicuous tower. A stone pier off the southern end of the village has a depth of 2 feet alongside at high water. Shataukok is connected with the railroad system.

A detached patch, over which the depth is 6 feet, lies about 450 yards offshore in a position nearly 600 yards southward of the customhouse in Shataukok.

A conspicuous building, a police station, stands a short distance inland on the northern side of the head of Starling Inlet in a position about 1 mile southwestward of Shataukok. A flagstaff stands near this building. The village of Ushekkok is close southward of the police station. Supplementary storm signals are displayed at the police station when local storm signals are displayed at Hong Kong.

COAST FROM MIRS BAY TO ROCKY HARBOR (*H. O. Chart 2593*).—A large indentation, Fung Bay, is entered around Fung Head, the southwestern point of the entrance to Mirs Bay. The land in the vicinity of Fung Bay is very hilly.

High Island is separated from the mainland only by a narrow shoal channel. The island lies with its eastern extremity about $3\frac{1}{2}$ miles south-southwestward of Fung Head. The southwestern shore of the island partially encloses Rocky Harbor.

Fung Bay.—This bay is entered between Fung Head ($22^{\circ}25' N.$, $114^{\circ}24' E.$, *H. O. Chart 2593*) and Taiyu Ngam, a point about $1\frac{3}{4}$ miles south-southwestward of the headland. Two conspicuous hills lie inland near Fung Bay; Taimun Shan, 1,201 feet high, is about $2\frac{1}{4}$ miles westward of Fung Head, and Taiyu Shan, 1,030 feet high, is about $\frac{3}{4}$ mile westward of Taiyu Ngam. Ping Hill, 753 feet high, lies about $\frac{1}{4}$ mile southwestward of Taiyu Ngam, and is conspicuous from southeastward.

Fung Bay is open to the eastward, and a heavy swell sets in except during the summer months. Chim Chow is a group of three islets lying about $\frac{1}{2}$ mile off the head of Fung Bay. The highest islet is 158 feet high, and the other islets are 132 feet high and 31 feet high, respectively. A $3\frac{3}{4}$ -fathom patch lies close westward of the southernmost islet, and a patch drying 6 feet lies close westward of the northernmost and smallest islet. Maungyu Tsui is a small projection dividing the head of Fung Bay into two portions. Within a sandy inlet in the southern portion is a village, Saiwan, where boats can land.

The depths in the entrance to Fung Bay are 10 to 12 fathoms, and the depths over a large part of the bay are $5\frac{1}{2}$ to 6 fathoms or more. In 1935 a British naval vessel reported numerous fishing stakes, which were awash, from $1\frac{1}{2}$ to $2\frac{1}{2}$ miles off the entrance to Fung Bay.

Storm signals according to the supplementary system (p. 31) are displayed at a police station near Taiyu Ngam when local storm signals are displayed in Hong Kong.

The coast trends about $1\frac{1}{2}$ miles southward from Taiyu Ngam to a point close off which is Conic Island. Ping Point is about midway along this section, and marks the entrance to a small inlet. Boole Rock, over which the depth is 4 fathoms, lies about 300 yards offshore northeastward of Ping Point. Two rocks, close together and each