

Chart 1464.

MENAI STRAIT.—**General remarks.**—Menai strait separates 25 the island of Anglesey from the mainland of Wales, and is about 20 miles in length, but is very narrow throughout, being less than $1\frac{1}{2}$ cables wide in places.

The Britannia tubular bridge, which has a clearance of 101 feet (30^m8) at high water springs, crosses the strait about $5\frac{1}{2}$ miles north- 30 eastward of Caernarvon (*Lat. 53° 08' N., Long. 4° 16' W.*); and Menai suspension bridge, which has a clearance of 100 feet (30^m5) at high water springs, crosses it about three-quarters of a mile farther eastward, or about $3\frac{1}{2}$ miles south-westward of Beaumaris.

That part of the strait, known as The Swellies, which lies between 35 the two bridges is much encumbered by rocks, and here the tidal streams have a rate of from 7 to 8 knots at springs.

The passage through the strait is available for vessels up to 260 feet (79^m2) in length. But even for small craft local knowledge is essential and the passage should only be attempted towards the time of high 40 water slack. *See* page 286.

Sea level.—The tide is about one hour later, and its range at springs is about 9 feet (2^m7) greater, at the north-eastern end of the strait than at its south-western end. Computations from the tidal data show that the greatest differences in sea levels occur about 45 one hour after high water at the north-eastern end, when the level is more than 6 feet (1^m8) higher at the north-eastern end than at the south-western end, and about $4\frac{3}{4}$ hours before, or $7\frac{1}{4}$ hours after, high water at the north-eastern end, when the relation between the levels is reversed, and level is more than 6 feet (1^m8) higher at the 50 south-western end than at the north-eastern end.

Tidal streams.—The streams in Menai strait are caused primarily by differences in sea level at its ends, but are modified by natural forces

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and local conditions. During certain periods the stream runs south-westward or north-eastward through the strait, during other periods streams run in at both ends and meet in the strait, during yet other periods streams run out at both ends and separate in the strait. The position in the strait at which the streams meet and separate is stated always to be situated between the north-eastern entrance and the Swellies (page 286).

The streams in the strait are referred to as north-east-going and south-west-going.

See also "Tidal streams" on page 283.

Approach to south-western entrance to Menai strait.—

The point on the southern side of the entrance and the coast southward of it are described on page 281. Within, and eastward of this point is Foryd bay, an inlet, of mud and sand, into which Afon Foryd and other streams flow.

The coast north-westward of Llanddwyon island (*Lat. 53° 08' N., Long. 4° 25' W.*) is remarked on at page 287.

Llanddwyon island, situated about 3 miles westward of the entrance, is connected with the coast of Anglesey. Pilots cove, at the south-eastern end of the island, affords shelter in case of need to boats, but great caution is necessary when running for it, on account of the dangers described below. There is a small tower on the southern entrance point of the cove. Ynys yr Adar, a small islet, is situated about one cable westward of the south-western extremity of the island.

Abermenai point, the northern point of the south-western entrance to Menai strait, is situated about 3 miles eastward of Llanddwyon island; at high water it appears as a narrow strip of sand, extending about $1\frac{1}{4}$ miles from the coast of Anglesey, but at low water, Traeth Melynog, an extensive flat, which dries and extends northward from it, occupies the greater proportion of the north-western side of the strait as far as Traeth Gwyllt, described below.

Lights.—A light is exhibited, at an elevation of 50 feet (15^m2), from a circular tower, 30 feet (9^m1) in height, with a white hut at the base, situated at the south-western end of Llanddwyon island. The small tower, on the southern entrance point of Pilots cove described above, must not be mistaken for this tower (*Lat. 53° 08' N., Long. 4° 25' W.*).

A light is exhibited, at an elevation of 20 feet (6^m1), from a white mast, 15 feet (4^m6) in height, situated on Abermenai point.

Pilotage.—Pilotage is compulsory for all merchant vessels, with certain exceptions. Owing to the constant changes in the channels and the great strength of the tidal streams, local knowledge is essential.

Vessels with a draught of over 7-feet (2^m1), except in an emergency and then only if they have up-to-date local knowledge, should not attempt the passage through the south-western entrance without the aid of a pilot.

Vessels requiring a pilot for the south-western entrance to the Menai strait should notify "Trinity Pilot, Caernarvon," in advance and on arrival should make the usual signals. For signals to be sounded in thick and foggy weather, see page 12.

Dangers.—**Buoys.**—Rocks, both sunken and which dry, extend about $1\frac{1}{4}$ cables southward of the southern end of Llanddwyon island.

A rock, with a depth of about 2 feet (0^m6) over it, marked on its

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southern side by a red can buoy, lies 3 cables southward of the light-house; another similar rock lies $4\frac{1}{2}$ cables south-south-eastward of the lighthouse. A rock, awash, lies about $1\frac{1}{2}$ cables eastward of the small tower on the south-eastern extremity of the island; a red can buoy is moored southward of this rock. 5

Tidal streams.—Westward of Caernarvon bar, *see* below, the streams run in about the direction of the coast; the north-going stream begins +0550 Holyhead (+0500 Dover), the south-going stream begins -0010 Holyhead (-0100 Dover); the spring rate in each direction is 1.5 knots. Between Belan and Abermenai point the streams run in the direction of the channel; the east-going stream begins +0530 Holyhead (+0440 Dover), the west-going stream begins -0040 Holyhead (-0130 Dover); the spring rate in each direction is 5 knots. 15

Inwards across the bar the direction of the north-going coast stream changes gradually to that of the east-going entrance stream; similarly, the direction of the west-going entrance stream changes gradually outwards across the bar to that of the south-going coast stream. Near low water, however, the streams run more in the direction of the channel across the bar, but near high water they run across the sands more in the direction of the coast stream. The rate of the north- and east-going stream increases gradually inwards across the bar, that of the west-going entrance stream decreases gradually outwards across the bar. 25

Bar.—The south-western entrance to Menai strait is obstructed by Caernarvon bar, which lies about 3 miles westward of the entrance points and connects the outer ends of South and North sands, extensive banks of sand, which dry and extend seaward from the coast for about 3 miles on either side of the entrance. The depth over the bar, in 1955, was 4 feet (1^m2), but the position of the banks is constantly changing, as are also the depths in the channel, and local knowledge is essential. 30

Buoyage.—Caution.—The entrances to Menai strait and the strait itself are buoyed in accordance with the uniform system described on page 18. For the purposes of this system, Caernarvon (*Lat.* 53° 08' N., *Long.* 4° 16' W.) is to be considered as the head of navigation and the colours of the buoys are:—red, for port hand buoys, and black for starboard hand buoys. 35

The buoys are moved from time to time, to meet the changes in the channel; details of their positions, for which recent information is necessary, are not given.

The bar channel and the channel up to the entrance points are marked by three port hand buoys, numbered C2, C4 and C6, and three starboard hand buoys, numbered C1, C3 and C5. 45

Within the entrance, between it and Caernarvon tidal basin, the channel is marked by three port hand buoys, Nos. C8, C10 and C12, and two starboard hand buoys Nos. C7 and C9.

A spherical buoy, painted in black and white horizontal bands and surmounted by a cone point up, is moored about half a cable south-westward of the entrance to the tidal basin at Caernarvon (*Lat.* 53° 08' N., *Long.* 4° 16' W.).

Beacon.—Mussel bank is a bank of stones, which dries, situated on the northern side of the entrance channel, about 7 cables west-

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south-westward of Abermenai point. A beacon, consisting of a red mast surmounted by a red can, stands near the middle of this bank.

Directions.—The sands at the south-western entrance are subject to constant changes, and the navigation through the strait, and particularly through The Swellies, is very intricate; local knowledge is essential.

Caernarvon.—Tidal basin.—Caernarvon is situated on the north-eastern bank of the mouth of Afon Saint, which flows into the south-eastern side of Menai strait, about $2\frac{1}{4}$ miles within the south-western entrance. Extensive harbour works front the town along the river bank and along the shore of the strait.

The entrance to the tidal basin is from the strait, and has depths of 14 feet (4^m3) at high water springs. The tidal basin has 1,746 feet (532^m2) of quayage. There is a landing place available at low water.

Caernarvon Inner harbour is formed by the mouth of Afon Saint, and is available for vessels of 13-foot (4^m0) draught at high water springs. A swing bridge, known as Aberferry bridge, crosses Inner harbour.

Lights.—A light is exhibited, at an elevation of 18 feet (5^m5), from a steel pillar, situated at the head of the pier which forms the southern side of the entrance to the tidal basin.

A light is exhibited, at an elevation of 18 feet (5^m5), from a green steel mast, 14 feet (4^m3) in height, situated at the north-eastern end of the north-eastern pile pier.

Lights exhibited, at an elevation of 18 feet (5^m5), from the engine-house on Aberferry bridge, indicate whether the bridge is open or closed. A light is exhibited from the end of each dolphin.

30 Anchorage.—There is good anchorage, for vessels waiting to go into the tidal basin, in depths of from 3 to 5 fathoms (5^m5 to 9^m1), westward of the tidal basin.

Bye-laws.—Bye-laws are in force for the Port and Harbour of Caernarvon. Special bye-laws are also in force concerning vessels carrying petroleum or carbide of calcium; copies of these bye-laws are obtainable from the Harbour Master.

Town.—Port facilities.—Caernarvon (*Lat.* $53^\circ 08' N.$, *Long.* $4^\circ 16' W.$) had a population, in 1951 of 9,255. The old walls of the town, flanked by towers, are in a good state of preservation, but the old castle, whose walls enclose an area of 3 acres, is in ruins.

There is a patent slip in the tidal basin. For details, *see* Appendix II, page 466.

Small supplies of coal can be obtained in the harbour.

The principal export is slate. The imports are petroleum products, timbers, fertilizers and cattle feeding stuffs.

In 1957, 98 vessels of 14,000 net registered tonnage entered the port.

Caernarvon to Port Dinorwic.—Buoys.—Traeth Gwyllt is a large bank which dries and occupies the greater part of the north-western side of the strait, for about $1\frac{1}{4}$ miles northward of Caernarvon. Ferry swatchway, which dries 2 feet (0^m6) in places, leads across the southern portion of this bank, opposite Caernarvon tidal basin.

A conical buoy, painted black and white in vertical stripes, marks the head of navigation (*see* page 283) and the north-western side of the channel, northward of the pile pier.

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There are depths of more than 4 fathoms (7^m3) in the channel over the greater part of the distance between Caernarvon and Port Dinorwic, which is situated on the same side of the strait as Caernarvon, about 3½ miles north-eastward, but about midway is a bar with a least depth of 9 feet (2^m7) in the fairway of the channel. 5

The channel between Caernarvon and Port Dinorwic is marked by three starboard hand black conical buoys, Nos. C9, C11 and C13, and one port hand red can buoy, No. C14. *See* pages 18 and 283.

Measured distance.—There is a measured distance of 6,075 feet 10 (1,851^m7) on the south-eastern side of the strait about half a mile south-westward of Port Dinorwic; each end is marked by a pair of transit beacons, the front beacons of each pair being near the low water line. The course for running the distance is 060°-240°.

Submarine cable.—A submarine power cable, the position of 15 which is shown on the chart, crosses the strait south-westward of the entrance to Port Dinorwic; the landing places of the cable in each case are marked by a beacon, consisting of a post surmounted by a diamond inscribed "Power cable. Warning."; the first two words are in white on a red ground, and the third in black on a white ground. 20 *See* page 12.

Port Dinorwic.—**Light.**—A light is exhibited, at an elevation of 15 feet (4^m6), from a post, 9 feet (2^m7) in height, situated on the pier-head at Port Dinorwic.

The harbour is composed of a tidal basin which dries, and a wet 25 dock close north-eastward of the basin. The tidal basin is 515 feet (157^m0) long and 175 feet (53^m3) wide, with depths of 14 feet (4^m3) at high water springs; the entrance is 70 feet (21^m3) wide.

The wet dock has 1,060 feet (323^m1) of quays; depths of 13 feet (4^m0) are maintained, normally, but can be increased to 15 feet (4^m6) 30 if necessary. It is entered from Menai strait through a lock, 180 feet (54^m9) long and 32 feet (9^m7) wide, with depths of 17 feet (5^m2) over the sill at high water springs.

Port facilities.—There is a dry dock; for details *see* Appendix 11, page 466. 35

There are a few small cranes and a 6-ton gantry.

Trade.—Port Dinorwic is the shipping place for the Llanberis quarries, and has a trade in slate.

Port Dinorwic to Britannia tubular bridge.—**Danger.**—**Foul ground.**—The shores between Port Dinorwic and Britannia tubular 40 bridge (*Lat.* 53° 13' N., *Long.* 4° 11' W.), which crosses the strait about 2½ miles north-eastward of the former place, dry out about half a cable on either side, in places, but there are depths of from 5 to 12 fathoms (9^m1 to 21^m9) in the fairway of the channel. The only danger in this reach is Careg Ginnog, a rocky ledge, which dries at extraordinary 45 spring tides, situated near the eastern shore of the strait about 12 cables northward of Port Dinorwic.

An area of foul ground, shown on the chart, extends across the strait about 6 cables northward of Port Dinorwic light-structure.

Chart 1464, plan of The Swellies. 50

Nelson monument is composed of a figure, 20 feet (6^m1) in height, standing on a pedestal, 22 feet (6^m7) in height, which is situated on a rock, close to the northern shore, about 2 cables westward of Britannia tubular bridge; this monument which was reported, in 1932, to

Chart 1464, plan of The Swellies.

be not easily discernible, in line with a beacon on the railway embankment, bearing 043° , leads close north-westward of Careg Ginnog.

Overhead cable.—A power cable suspended between two pylons, 5 one on each side of the strait, crosses the strait, parallel with Britannia tubular bridge, about 200 feet (61^{m0}) south-westward of it; there is clearance under the cable of 100 feet (30^{m5}) at high water springs.

Lights.—Beacons.—Two leading lights are exhibited, the front 10 light from a steel framework tower, 15 feet (4^{m6}) in height, situated about a quarter of a cable north-eastward of the Britannia bridge; and the rear light from a steel framework tower, 30 feet (9^{m1}) in height, situated close westward of the southern pier of the bridge. These lights in line bear 231° .

15 A white triangular beacon, 10 feet (3^{m0}) in height, base 6 feet (1^{m8}), stands on the shore about $1\frac{1}{4}$ cables east-north-eastward of the southern pier of the Britannia bridge.

A light is exhibited, at an elevation of 15 feet (4^{m6}), from a white circular brick tower, 12 feet (3^{m7}) in height, situated on Price point 20 about 4 cables east-north-eastward of the southern pier of the Britannia bridge; *see* page 12.

A beacon, consisting of a white mast surmounted by a cone point up and fitted with reflectors, stands on Swelly rock about three-quarters of a cable north-eastward of Price Point light-tower.

25 **Submarine cables.**—Submarine cables, the positions of which are shown on the chart, cross the strait north-eastward of the suspension bridge.

The Swellies.—Directions.—The Swellies is the name given to the reach, encumbered with rocks and islets, which lies between 30 Britannia tubular bridge and Menai suspension bridge, about 8 cables eastward.

There are two channels through the Swellies; the southern, along Caernarvon shore, which is the more direct, and that most generally used; and the northern channel or Anglesey passage.

35 The southern channel passes southward of Britannia rock, on which stands the central pier of Britannia tubular bridge (*Lat.* $53^{\circ} 13' N.$, *Long.* $4^{\circ} 11' W.$), southward of Cribbin and Swelly rocks, and northward of Platters rock. The shore bank on the southern side of this channel, south-westward of Swelly rock, was reported, in 1928, to have extended 40 to the northward, there being depths of only 4 feet (1^{m2}) at about one-third of a cable from the shore.

Owing to these rocks and islets, and to the strength of the tidal streams, whose rates vary from 8 knots at springs to 5 knots at neaps, with very little slack water, the navigation is dangerous and should 45 never be attempted without an experienced pilot; in case of emergency, however, and the services of a pilot not being available, the following directions may be of service:—The best time to make the attempt is at high water, slack, which normally occurs at about $1\frac{1}{2}$ hours before high water at Holyhead. Attention is drawn to the remarks on tidal 50 streams on page 281. *See* views, 1, 2 and 3 facing this page.

A vessel should sound a long blast when passing under either bridge towards The Swellies, to take the channel, as a vessel approaching in the opposite direction is obscured from view by the high ground of the Caernarvonshire coast.

Chart 1464, plan of The Swellies.

A vessel approaching from westward should pass between the central and southern piers of Britannia tubular bridge, steering about 075°; thence she should steer about 069°, until the leading light-towers come into line, astern, bearing 231°, which marks should be followed 5 until the large chimney of the house Glenaethwy bears about 089° and is just open northward of the southern pier of Menai suspension bridge (view 2), which mark should be steered for until the cross on the summit of Ynys Llandysilio is nearly abeam, whence the vessel should steer for the northern pier of the Menai bridge until the whole of 10 Glenaethwy is open of the southern pier, whence she should steer to pass under the centre of the bridge.

At night a vessel approaching from westward should, when the front leading light bears about 085°, steer with it about 5° on the starboard bow and pass between the central and southern piers of 15 Britannia bridge. Thence she should steer for Price Point light bearing 062° until the leading lights are in line, astern, bearing 231°, which line should be followed until Price Point light is abeam, whence she should steer 094° until Price Point light turns from *red* to *white* bearing 239°, whence she should steer about 084° so as to pass under the centre 20 of Menai suspension bridge.

A vessel approaching from eastward should pass under the centre of Menai suspension bridge and steer with the northern power cable pylon in line with the southern chimney of the cottage on Gored Goch, bearing about 263° (view 3) until Swelly Rock beacon is abeam; 25 whence she should haul out gradually until the northern pylon is in line with the northern end of the buildings on Gored Goch (*Lat. 53° 13' N., Long. 4° 11' W.*). The vessel should steer on this mark until the leading light-towers near the southern pier of Britannia bridge are in line bearing 231°, which latter marks should be steered 30 for until the white triangular beacon on the southern shore is abeam, whence she should haul out to pass under the centre of the span between the central and southern piers.

At night a vessel approaching from eastward should steer about 221° so as to pass under the centre of Menai suspension bridge. Thence she should steer about 263° in the *white* sector of Price Point light, until Price Point light changes from *white* to *red* bearing 239°, when she should gradually haul out northward until the leading lights are in line, bearing 231°, and proceed as directed above.

The northern channel passes northward of Britannia rock; westward 40 and northward of Gored Goch, two rocky islets with some houses and a flagstaff on them and surrounded by a salmon weir; northward of Swelly rock and the rock which lies north-eastward of it, between them and Ynys Benlas; between the rock north-eastward of Swelly rock and Careg Halan; and between Careg Halan and Platters rock. 45

That portion of Menai strait which lies north-eastward of Menai suspension bridge is described on page 309.

Chart 368.

COAST.—The coast between Llanddwyn island (*Lat 53° 08' N., Long. 4° 25' W.*) and Penrhyn Mawr, the south-western extremity of 50 Holy island, 13½ miles north-westward, is indented by many small bays; ledges and detached rocks, some of which dry while others have so little water over them as to occasion a heavy sea in bad weather,

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MENAI STRAIT.—North-eastern entrance.—The southwestern portion of the strait has been described on page 281. The north-eastern entrance to Menai strait is through Beaumaris bay,

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see page 315. The navigable channel is confined to the Anglesey side of the bay, the channel running between the Anglesey shore and Dutchman bank and Lavan sands, which encumber the south-western portion of the bay. The entrance to this navigable channel is divided into two by Puffin island or Priestholm.

North-west Entrance channel, which lies between Puffin island and Trwyn-du, has a least depth of 14 feet (4^m3) in the fairway, and, being direct and well marked, is more generally used.

North-east Entrance channel, which lies between Puffin island and Irishman spit (page 312), has a least depth of 3 feet (0^m9) in the fairway. A large sandbank, which dries 4 feet, lies about half a mile south-eastward of Trwyn-du lighthouse. It is not buoyed and should not be attempted without local knowledge.

Pilots.—See page 282.

Pilotage is compulsory for all merchant vessels, with certain exceptions. Vessels requiring a pilot for the north-eastern entrance should notify "Trinity Pilot, Caernarvon", (Telephone Caernarvon 2900) 12 hours in advance and on arrival seaward of Trwyn-du point should make the usual signals. For signal to be sounded in thick or foggy weather, see page 12.

Light.—Bell.—A rocky shelf, which is covered at high water, extends about one cable north-north-eastward from Trwyn-du (*Lat. 53° 19' N., Long. 4° 02' W.*). Trwyn-du light is exhibited, at an elevation of 61 feet (18^m6), from a white circular castellated tower with three black bands, 96 feet (29^m3) in height, situated at the outer end of this rocky shelf.

A bell is sounded continuously at the lighthouse.

On the lighthouse, and also on a notice board nearby, are painted the words:—"No passage landward of the lighthouse."

The rocky ledge on which the lighthouse stands extends about 100 feet (30^m5) seaward of the lighthouse.

The lightkeepers' houses are situated on Trwyn-du. See view facing this page.

Puffin island or Priestholm.—Beacon.—Puffin island or Priestholm is situated about 4 cables north-eastward of Trwyn-du. The tower of a ruined chapel, with an elevation of 151 feet (46^m0), stands near the centre of the island, and at its north-eastern end are the ruins of a house. The island is fringed by a rocky ledge which does not extend more than half a cable except at its south-western end, whence rocks, which dry 13 feet (4^m0), extend about a quarter of a mile south-westward. The south-western extremity of this ledge, named Perch rock, is marked by a conical concrete beacon, painted red and white in vertical stripes and surmounted by a red can, with an elevation of 25 feet (7^m6).

There is a landing place, just eastward of the south-western extremity of the island, which may generally be used except during strong south-easterly winds.

North-west Entrance channel.—Dangers.—Buoys.—Dinmor bank is the north-western portion of the foul ground, which, with depths of less than 3 fathoms (5^m5), extends about 7 cables north-westward from Trwyn-du lighthouse, and forms the south-western side of the North-west Entrance channel. There is a least depth of 8 feet (2^m4), situated about 3½ cables from the lighthouse.

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A black conical buoy, marked *Dinmor*, is moored northward of the north-western extremity of Dinmor bank.

Ten Feet bank, with a least depth of 10 feet (3^m0), lies on the 5 northern side of the North-west Entrance channel. It extends, with depths of less than 3 fathoms (5^m5), for about 4 cables westward from a position 5 cables north-westward of Puffin island tower (*Lat.* 53° 19' N., *Long.* 4° 02' W.). Isolated patches of less than 3 fathoms (5^m5) are found up to 5 cables further westward.

10 A spherical buoy, painted red and white in horizontal bands and marked *Ten Feet Bank*, is moored near the western end of the bank.

A course of 090° to pass three-quarters of a mile northward of the north-eastern extremity of Puffin island will lead between Ten Feet bank and Dinmor bank in depths of 5 fathoms (9^m1). Perch Rock 15 beacon, bearing 137°, leads between the two banks in the same depth.

Porth-longdy house, in Redwharf bay, bearing 255° and open of Careg Onnen, leads northward of Ten Feet bank.

A narrow, stony spit, which dries, extends about 2½ cables south-south-eastward from Perch rock. A rocky bar, with a least depth in the 20 channel of 15 feet (4^m6), connects this spit with the coast about 1½ cables southward of Trwyn-du lighthouse. A sandbank, which dries 4 feet (1^m2), lies three-quarters of a cable south-eastward of the stony spit. A swashway, between the sandbank and the stony spit, with a least depth of 3 feet (0^m9), connects the North-east Entrance channel 25 with Outer road.

Chart 1170a.

Southern shore of Beaumaris bay.—Aspect.—Penmaen Mawr point, situated about 4 miles south-eastward of Puffin island, is rocky (*see* view C on chart 1170a). The village of Penmaen Mawr is 30 situated on the coast about one mile eastward of the point. There are two piers here, where coasters load stone from the neighbouring quarries. When loading at night the piers and the tramways to the quarries are lit by electric lights, which show up brilliantly. The village of Llanfairfechan, situated about one mile south-westward of Penmaen 35 Mawr peak is also well lighted at night.

The coast between Penmaen Mawr point and the mouth of Afon Ogwen, about 5 miles south-westward, is low, and forms the foot of a mountainous background.

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40 Westward of Afon Ogwen, the low coast continues, round Bath point (*Lat.* 53° 14' N., *Long.* 4° 05' W.), to the projecting point of Penrhyn, and within rises a prominent hill, on which is Penrhyn park with its castle, the towers of which are visible from every part of the strait.

45 **Outer road.—Anchorage.**—A pool, with depths of 15 fathoms (27^m4), lies immediately southward of the bar, and southward of this pool the depths decrease gradually to Outer road, in which there are depths of from 9 to 36 feet (2^m7 to 11^m0). During north-easterly 50 gales, the sea in the roadstead is so broken by the outer banks that a well-found vessel will find no difficulty in riding to it.

The best anchorage is in depths of from 10 to 18 feet (3^m0 to 5^m5), sand and shell, with St. Seiriol church in line with Penmon chimney bearing 278½°, and about 2½ cables distant from Penmon point, (*Lat.* 53° 18' N., *Long.* 4° 03' W.).

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Tidal streams.—Beaumaris bay forms the north-eastern entrance to the strait, but the strait itself, with land on both sides, begins off Garth point, at the head of the bay. The channel of the strait continues along the north-western shore of Beaumaris bay, out to Trwyn-du and Puffin island, but the south-eastern side of this part of the channel is formed by sandbanks, which cover at high water, and the streams in it are affected by the Beaumaris bay and coastal streams and differ from those in the strait.

In the channel between Trwyn-du and Puffin island the in- (south-) going stream begins -0510 Holyhead (-0600 Dover), the out- (north-) going stream begins -0025 Holyhead (-0115 Dover); the spring rate in each direction is about 3 to 4 knots. In the channel south-eastward of Puffin island the south-west-going stream begins -0340 Holyhead (-0430 Dover), the north-east-going stream begins +0220 Holyhead (+0130 Dover); the spring rate in each direction is about 4 knots.

In Outer road, south-eastward of Trwyn-du, the south-west-going stream begins -0545 Holyhead (+0550 Dover), the north-east-going stream begins -0100 Holyhead (-0150 Dover).

Off Beaumaris the south-west-going stream begins -0335 Holyhead (-0425 Dover), the north-east-going stream begins +0225 Holyhead (+0135 Dover); the spring rate in each direction is about 3 knots.

Between Beaumaris and Bangor pier, the streams are comparatively weak and liable to vary according to the prevailing wind. Their rates are unlikely to exceed about 3 knots at springs.

In Bangor pool the south-west-going stream begins about -0400 Holyhead (-0130 Dover) and the north-east-going stream begins about +0420 Holyhead (+0330 Dover); the spring rate in each direction is about 3 knots.

Charts 1464, 1170a.

Directions.—A vessel approaching North-west Entrance channel from westward should steer for Puffin island tower bearing 105°, which leads between Dinnor and Ten Feet banks, until Perch rock beacon bears 137°, when this course should be steered. When Trwyn-du lighthouse is abeam the vessel should steer about 174° and pass midway between the beacon and Trwyn-du and anchor as directed above.

Local knowledge is essential for navigating North-east Entrance channel.

Chart 1464.

South-eastern coast of Anglesey.—Beacon.—Trwyn-du is described on page 309.

A ruined slipway extends 100 yards south-eastward from the coast, about 2 cables southward of Trwyn-du lighthouse.

In 1959, a wreck, which dried 3 feet (0^m9), lay about one mile southward of Trwyn-du lighthouse.

Penmon point is situated about 4½ cables south-south-westward of Trwyn du (*Lat.* 53° 19' N., *Long.* 4° 02' W.), and three-quarters of a mile farther south-westward is Trwyn y Penrhyn. Penmon bay, which is entered between Penmon point and Trwyn y Penrhyn, dries from one to 3 feet (0^m3 to 0^m9) for a distance of about 1½ cables outside the line joining the entrance points. Two disused jetties are situated in Penmon bay. One, close westward of Penmon point, is

Chart 1464.

built of wood and the other, midway between the points, is built of stone. A conspicuous chimney stands at the head of each jetty. A rock, which dries 20 feet (6^m1), lies close off Trwyn y Penrhyn.

5 Tre-castell point is situated about 11 cables south-westward of Trwyn y Penrhyn, and between these points is a bight, which dries out as much as 3 cables in places. The foreshore consists of stones and rocks, many of which stand up 5 or 6 feet (1^m5 to 1^m8) above the general level, and are therefore dangerous to small craft.

10 Careg Duon, a rock 2 feet (0^m6) high, stands about half a cable offshore at the head of this bight.

A large fish weir, the eastern angle of which is marked by a perch, is situated about 2 cables southward of Careg Duon.

A radio mast stands about half a mile northward of Tre-castell 15 point. This mast in line with the radio mast (page 307) bearing 300° 27' is useful for checking compasses.

Friars bay is entered between Tre-castell point and a point about one mile south-westward; it dries out about 1½ cables. Beaumaris lifeboat slip extends about 1½ cables from the coast just southward 20 of Tre-castell point. A fish weir, situated on the south-western side of the slipway is marked at its south-western end by a red beacon. An engineering works stands among the trees, near the head of Friars bay where there are two small slipways. Southward of the engineering works the coast becomes clifty, attaining an elevation of 65 feet (19^m8) at Battery 25 hill about half a mile southward.

Lights.—A light is exhibited from the radio mast northward of Tre-castell point.

Two lights, disposed vertically 6 feet (1^m8) apart, are exhibited from the seaward end of the lifeboat house.

30 A light is exhibited, at an elevation of 26 feet (7^m9), from a post, 6 feet (1^m8) in height, situated at Mount Field, northward of Battery hill.

Coastguard.—**Life-saving.**—**Storm signals.**—There is a coast-guard station at Trwyn-du; see page 17. A motor lifeboat is stationed at Tre-castell point and a line-throwing apparatus is maintained at 35 Trwyn-du; see pages 17 and 18. Storm signals are displayed at the coastguard station; see page 10.

South-eastern side of Menai strait.—The south-eastern side of the north-eastern entrance to Menai strait, between Puffin island and Bangor flats, about 5 miles south-westward, is formed by Irishman 40 spit, which dries 2 feet (0^m6) in places; Dutchman bank, which dries 10 feet (3^m0) in places; and Lavan sands, which dry from 10 to 19 feet (3^m0 to 5^m8) over the greater part of their area.

These sandbanks are almost continuous, being broken only by Midlake swatch between Irishman spit and Dutchman bank, and The 45 Pool, between Dutchman bank and Lavan sands. They extend as much as 3½ miles from the coast between Penmaen Mawr point (*Lat.* 53° 16' N., *Long.* 3° 57' W.) and the mouth of Afon Ogwen (page 310).

Friars bank, with a least depth of 9 feet (2^m7), lies about 8 cables southward of Tre-castell point and divides the channel into two 50 passages, having depths of 19 and 13 feet (5^m8 and 4^m0) respectively. The wider but shallower channel is eastward of the bank.

Anchorage.—There is an anchorage in the channel abreast Beaumaris (see page 313) in depths of from 4 to 5 fathoms (7^m3 to 9^m1), sand.

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Directions.—Buoyage.—Local knowledge is essential, but if circumstances compel, and a pilot is not available, a vessel should steer by the buoys, which are moored, as necessary, to meet the changes in the channel; *see* pages 18 and 283. 5

Beaumaris.—Beaumaris fronts the shore westward of the southern entrance point of Friars bay. Beaumaris castle, an historic ruin, is situated at the north-eastern end of the town; and the church, with a square tower, stands in the middle of the town.

A pier only suitable for small craft extends about one cable south-10 eastward from the coast abreast of the town, and has depths of 13 feet (4^m0) alongside its head.

In 1951, Beaumaris had a population of 2,128.

Light.—A light is exhibited, at an elevation of 17 feet (5ⁿ2), from a mast, 14 feet (4^m3) in height, situated on the pierhead. 15

Port facilities.—Moderate supplies of stores are obtainable. Repairs to small craft may be effected at Gallows point boatyard, about half a mile south-westward.

Trade.—There is but little trade. The principal imports are coal, timber and grain, and the exports consist mostly of slates, limestone, 20 and slabs.

Menai strait above Beaumaris.—The north-western shore of the strait between Beaumaris and Gallows point (*Lat.* 53° 15' N., *Long* 4° 06' W.), situated about 5 cables south-westward of the pier, is low and flat; the foreshore, fronted by a brick wall, consists of mud 25 and sand and is well adapted for vessels to lie aground.

Garth-y-don is a point situated about one mile south-westward of Gallows point. This point, at which there is a jetty, is the landing place of the ferry from Bangor pier, described below.

Measured distance.—A measured distance of 3,036 feet (925^m4) 30 is situated between Gallows point and Garth-y-don; the running course is 055° and 235°. The marks, which are situated on the foreshore at each end, are square wooden posts, about 12 feet (3^m7) in height. The distance between the front and rear beacons of the eastern pair is about 70 feet (21^m3), and of the western pair about 50 feet 35 (15^m2).

Bangor flats.—Beacon.—Bangor flats, which are a continuation southward of Lavan sands, remarked on at page 312, dry out about three-quarters of a mile northward from Bath point and the coast westward of that point. They are partly occupied by salmon weirs and 40 mussel banks. At the outer and northern angle of Cegin weir, which is the most westerly, is a black perch surmounted by a globe.

Port Penrhyn.—Anchorage.—Mooring buoys.—Port Penrhyn, the port of the city of Bangor, is situated, close north-eastward of that city, about three-quarters of a mile westward of Bath point (page 310). 45 It is a tidal harbour, with depths of from 11 to 13 feet (3^m4 to 4^m0) at high water springs.

At its eastern side are two privately owned piers, with a tidal basin between them, about 2 cables in length, with depths of from 13 to 17 feet (4^m0 to 5^m2) alongside at high water springs. 50

Bangor pier, on iron piles, extends about 2½ cables north-westward from Garth point, the western entrance point of Port Penrhyn.

There is anchorage, for vessels waiting to pass through the Swellies, off Bangor pier in depths of from 3 to 5 fathoms (5^m5 to 9^m1).

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There are six mooring buoys in Bangor pool, the positions of which can best be seen on the chart.

Light.—A light is exhibited, at an elevation of 25 feet (7^m6) from a green and white framework tower, 15 feet (4^m6) in height, situated on the head of Bangor pier (*Lat. 53° 14' N., Long. 4° 07' W.*).

Port facilities.—There are two patent slips. For details of the larger see Appendix II, page 467.

Moderate supplies of stores are obtainable. Repairs to small craft may be effected.

Menai strait above Bangor pool.—The south-eastern side of Anglesey between Garth-y-don and Craig-y-don about 8 cables south-westward is rocky and steep-to. From Craig-y-don to St. George's pier, about 7½ cables south-westward, the shore is fringed with rocky islets behind which lies a bay of mud and stones, which dry 13 feet (4^m0).

The south-eastern side of Menai strait between Bangor pier and a point about one mile south-westward consists of mud, sand and stones and dries 13 feet (4^m0) in places. From this point to Menai suspension bridge, about 8 cables south-westward the shore is rocky and steep-to.

Depths.—Beacons.—There is a least depth of 14 feet (4^m3) in the main channel abreast Ynys Castell, an islet on the north-western shore, about 3 cables south-westward of Craig-y-don. There is a depth of 10 feet (3^m0) at the outer end of St. George's pier, which is used by vessels frequenting the strait during the summer.

A drying rocky ledge, close inshore and about 2 cables south-south-westward of St. George's pier, is marked by a white beacon with a triangular topmark. Two beacons, each painted white with a diamond topmark and situated on either shore close eastward of Menai suspension bridge mark the shore ends of a telegraph cable from Anglesey to the mainland.

Lights.—A light is exhibited at the head of St. George's pier.

A light is exhibited, at an elevation of 12 feet (3^m7), from a red iron mast 26 feet (7^m9) in height, about half a cable north-eastward of Menai suspension bridge.

Directions.—A vessel approaching the Swellies from Gallows point should leave No. 7B black conical buoy close on the starboard hand and steer for Garth-y-don landing jetty. When the ruined bathing hut, about 5 cables south-westward of Gallows point, is abeam, vessels should steer to leave the mooring buoys in Bangor pool close to starboard and maintain a mid-channel course to pass midway between the white beacon about 2 cables south-south-westward of St. George's pier and the south-eastern shore. From this point vessels should steer to pass under the centre of Menai suspension bridge (page 281).

The Swellies, the name given to the reach between Menai suspension bridge and Britannia tubular bridge, is described on page 286, and the strait south-westward of The Swellies in the preceding pages.

Tidal streams.—In Menai strait between Garth point and Belan between about —0040 and +0420 Holyhead (—0130 and +0330 Dover) the stream runs south-westward through the strait, from off Garth point to off Belan; at about the latter time the north-east-going stream begins off Garth point, and till about +0530 Holyhead (+0440 Dover) the south-west-going stream to Belan separates from the north-east-going stream to Garth point in the strait between Garth point and The Swellies.

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The north-east-going stream begins off Belan about + 0530 Holyhead (+ 0440 Dover), and between that time and about — 0100 Holyhead (— 0200 Dover) the stream runs north-eastward through the strait from Belan to Garth point; at about the latter time the south-west-going stream begins off Garth point, and till about — 0040 Holyhead (— 0130 Dover), when the south-west-going stream begins off Belan the north-east-going stream from Belan meets the south-west-going stream from Garth point in the strait between Garth point and The Swellies. 5 10

The streams run generally in the direction of the channel, but at bends a set towards the outer side must always be expected. The spring rate of the stream in both directions is about 3 knots in the wider parts of the channel, but more in the narrower parts. In the south-western entrance, between Belan and Abermenai point, the spring rate is about 5 knots in both directions; north-eastward of Menai suspension bridge, and south-westward of Britannia tubular bridge, the spring rate increases to about 6 knots, and between the bridges, in the channels in The Swellies, to about 8 knots, in both directions. 15 20

The streams in The Swellies, and to a less extent in the strait north-eastward and south-westward of the bridges, are affected by winds at sea outside the entrances. With strong southerly and south-westerly winds both the duration and the rate of the north-east-going stream are increased, and the stream may begin about a quarter of an hour earlier and end about a quarter of an hour later than usual, with corresponding reductions in the duration and rate of the south-west-going stream. Strong north-easterly winds have the opposite effect. 25 30