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PERSIAN GULF PILOT

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H. O. No. 158

PERSIAN GULF PILOT

COMPRISING

THE PERSIAN GULF, THE GULF OF OMÁN

AND

THE MAKRÁN COAST

FIRST EDITION

PUBLISHED AND SOLD BY THE HYDROGRAPHIC OFFICE
UNDER THE AUTHORITY OF THE
SECRETARY OF THE NAVY

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WASHINGTON
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A Summary of Notices to Mariners, for the year 1920, affecting this publication will (if published) be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C. (See Preface.)

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PERSIAN GULF PILOT

PREFACE.

This publication, the first edition of Hydrographic Office Publication No. 158, The Persian Gulf Pilot contains Sailing Directions for the Persian Gulf, the Gulf of Omán, and the Coast of Makrán, commencing at Rás al Hadd and following the southwestern shore of the Gulf of Omán, with the southern and western shores of the Persian Gulf to the Shatt al Arab, at its head. Then from Rás Muari (lat. 24° 50′ N., long. 66° 40′ E.) along the Makrán coast, the northern and eastern shores of the Gulf of Omán, and the northern and northeastern shores of the Persian Gulf, to and including the Shatt al Arab. The work is taken mainly from the British Admiral publication, Persian Gulf Pilot and Supplement No. 4, 1919; and is corrected to H. O. N. M. No. 12, 1920.

The bearings and courses are true and are given in degrees, from 0° (north) to 360° (clockwise).

Bearings limiting sectors of lights are toward the light.

The directions of wind refer to the points from which they blow; of currents, the points toward which they set. These directions are true.

Variations, with the annual rate of change, may be obtained from H. O. Chart No. 2406, " Variation of the Compass."

Distances are expressed in nautical miles, the mile being approximately 2,000 yards.

Soundings are referred to low water ordinary springs unless otherwise stated.

Heights are referred to mean high water, spring tides.

The latest information regarding lights, their characteristics, sectors, fog signals, and submarine bells should always be sought in the Light Lists, as all the details are not given in this volume, and changes are likely to occur.

Summary of Notices to Mariners.—While it is the intention of the Hydrographic Office to publish about the first of each year a Summary of Notices to Mariners, of the preceding year, affecting the volume, it must be understood that these summaries are intended to include only important changes and corrections and that their

publications may be discontinued at any time, especially when a new edition of the book is issued.

Masters of vessels should keep complete files of weekly Notices to Mariners and supply themselves with the latest List of Lights, and seek from local authorities, pilots, and harbor masters the latest information relative to any special regulations in force in the particular locality visited.

Mariners are requested to notify the United States Hydrographic Office, Washington, D. C., or one of its branch offices of errors they may discover in this publication, or of additional matter which they think should be inserted.

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Glossaries of words occurring in the charts and sailing directions.

ARABIC.

Arabic.	English.	Arabic.	English.
'Abbas [1]	Muhammad's uncle.	Má	Water.
Abu or Bu	Father of, i. e., producing or abounding in; also large.	Maidán	Plain, open space.
Aich or Aik	A hard bank.	Majidi	A silver Turkish coin, value about 3s. 6d.
Báb	A narrow strait; a gate.	Marakat	A shoal with soft bottom.
Balad	A town; village; land.	Mersa	An anchorage.
Bar	Territory; country; land.	Minár	Tower, minaret.
Beiyat	A shoal which dries.	Naiwa	A shoal.
Dohat or Dúhat	A bay.	Nakhil	A date grove.
Fasht	A rocky reef.	Nakhl	A palm tree.
Ghail	Source of a stream.	Nashi	Northeasterly wind.
Ghár	A cave.	Rak or Rakat	A hard bank or shoal, but no overfalls; not dangerous.
Hadd	Spit of sand; low sandy point; also boundary.	Rás	A cape, head, or a projecting point above or below water.
Hálat	A sandbank which is dry or dries.	Rig	A shallow flat bank extending offshore; sand.
Hassar	A rock.	Ruus	Plural of Rás.
Heir	A pearl bank.	Saghira	Small.
Hisár	A fort.	Seghir	Small.
Jabal or Jebel	A hill or mountain; also island.	Seil	A torrent.
Jabál or Jebál	Plural of Jabal or Jebel.	Séria	Small.
Jazáir or Jezáir	Plural of Jazírat or Jezírat.	Shab	A rocky shoal.
Jazírat or Jezírat	An island; sometimes peninsula.	Shatt	Fresh water river; large river.
Kabira	Large.	Sherm	A creek or small cove.
Kad	A shoal.	Shur	Low clay hills.
Karn	A peaked hill; a point.	Sífa	A sand beach.
Kasr	A palace.	Suhail	Canopus.
Kassár	A rock above or below water.	Suhaili	Southwesterly wind.
Katah	A patch of rocks.	Tal	A hillock.
Katat	A patch of rocks.	Turbat	A tomb.
Kaus	Southeasterly wind.	Umm	Mother of, used similarly to Abu it is often joined to the following words by omitting the u, and prefixing m, as Umm Gheir contracted to Magheir.
Kebir	Large.		
Khor or Khúr	A bay or creek; a deep channel between shoals.		
Khuwair	Diminutive of Khúr.		
Kubbat	A deep water bay or inlet.	Wádi	A river bed; valley.
Kút	A fort.		

[1] Also Persian.

PERSIAN.

Persian.	English.	Persian.	English.
'Alí	Son-in-law and fourth successor of Muhammad; high.	Krán	A Persian coin; one-tenth of a túmán.
Bád	Wind.	Kúh	A mountain or hill.
Bád-gir	A wind chimney; wind tower.	Man	A Tabriz man=6½ pounds; it varies in different parts.
Bandar	An anchorage sheltered from any direction; harbor; landing place.	Masjid	A Mosque.
		Nahr	A canal or creek.
Bár	Ditch; entrance; load.	Náib	Lieutenant.
Bázár	Market place	Nasím	A breeze.
		Rig	A shallow flat bank retending offshore; sand.
Dáman	Skirt; foot of mountain.		
Dasht	Desert.	Sabz	Green.
Dáúd	David.	Safid	White.
Diz	A fortress.	Sar	A peak or summit.
Farsakh	The distance that can be covered by a baggage animal in one hour; its mean distance is 3.915 statute miles.	Sháhi	A Persian coin; one-twentieth of a krán.
		Shahr	A city.
		Shaikh	Chief; venerable learned man old man.
Garmsír	Winter pastures		
Gil	Mud, clay.	Shamál	Northwesterly wind.
Gumruk	Customs.	Sharki	Southeasterly wind.
Imám	Religious leader.	Siah	Black.
Kabúd	Blue	Surkh	Red.
Kalát	A castle on top of a mountain.	Túmán	A Persian money unit, equivalent to 10 kráns.
Kar (Baluchi)	A stream.		
Khán	Lord.		
Kharwár	A donkey load; a Tabriz Kharwar=650 pounds; it varies in different parts.		

Glossaries of words occurring in the charts and sailing directions—Continued.

TURKISH.

Turkish.	English.	Turkish.	English.
Ághá or Aká.....	Master	Kum.....	Sand.
Bulút.....	Cloud.	Su.....	Water.
Dágh.....	A mountain.	Tagh.....	A mountain.
Kara.....	Black.		

Bágala, a native vessel of 100 to 400 tons in Persian Gulf.
Bakara, a native vessel of 10 to 120 tons in Persian Gulf.
Batil, Dangi, Machwa } Native vessels on Makrán coast.

The words al, ar, as, ash, az, an, ad, at, which precede many names, are different sounds of the Arabic definite article.

The letters g, j, and y, also g and k, are often permutable in the names used in this book, according to the dialect of the speaker; also the letters l and r, p and f, are used indifferently.

INFORMATION RELATING TO NAVAGATIONAL AIDS AND GENERAL NAVAGATION.

Publications.—The principal publications of the United States Hydrographic Office for the use of navigators are: Charts, Sailing Directions, American Practical Navigator, Altitude and Azimuth Tables, International Code of Signals, Light List, Notices to Mariners, Pilot Charts, and Hydrographic Bulletins. Of these the Notices to Mariners and the Hydrographic Bulletins are free to mariners and others interested in shipping. The Pilot Charts are free to contributors of professional information, but are sold to the general public at 10 cents a copy; other publications of the office are sold under the law at cost price, and can be purchased directly from the office or through its sales agencies, but are not sold by branch hydrographic offices.

Charts when issued are corrected to date.

The dates on which extensive corrections are made are noted on the chart on the right of the middle of the lower edge; those of the smaller corrections at the left lower corner.

The edition and corresponding date of the chart will be found in the right lower corner outside the outer neat line.

Planes of reference.—The plane of reference for soundings on Hydrographic Office charts made from United States Government surveys and on Coast and Geodetic Survey charts of the Atlantic coast of the United States is mean low water; on the Pacific coast of the United States as far as the Strait of Juan de Fuca, it is the mean of the lower low waters; and from Puget Sound to Alaska, the plane employed on Hydrographic Office charts is low water ordinary springs.

On most of the British Admiralty charts the plane of reference is the low water of ordinary springs; on French charts, the low water of equinoctial springs.

In the case of many charts compiled from old or various sources the plane of reference may be in doubt. In such case, or whenever not stated on the chart, the assumption that the reference plane is low water ordinary springs gives a larger margin of safety than mean low water.

Whichever plane of reference may be used for a chart it must be remembered that there are times when the tide falls below it. Low

water is lower than mean low water about half the time, and when a new or full moon occurs at perigee the low water is lower than the average low water of springs. At the equinoxes the spring range is also increased on the coasts of Europe, but in some other parts of the world, and especially in the Tropics, such periodic low tides may coincide more frequently with the solstices.

Wind or a high barometer may at times cause the water to fall below even a very low plane of reference.

On coasts where there is much diurnal inequality in the tides, the amount of rise and fall can not be depended upon and additional caution is necessary.

Mean sea level.—The important fact should be remembered that the depths at half tide are practically the same for all tides whether neaps or springs. Half tide therefore corresponds with mean sea level. This makes a very exact plane of reference, easily found, to which it would be well to refer all high and low waters.

If called on to take special soundings for the chart at a place where there is no tidal bench mark, mean sea level should be found and the plane for reductions established at the proper distance below it, as ascertained by the Tide Tables, or by observations, or in some cases, if the time be short, by estimation, the data used being made a part of the record.

Accuracy of chart.—The value of a chart must manifestly depend upon the character and accuracy of the survey on which it is based, and the larger the scale of the chart the more important do these become.

To judge a survey, its source and date, which are generally given in the title, are good guides. Besides the changes that may have taken place since the date of the survey in waters where sand or mud prevails, the earlier surveys were mostly made under circumstances that precluded great accuracy of detail; until a chart founded on such a survey is tested it should be used with caution. It may, indeed, be said that, except in well-frequented harbors and their approaches, no surveys yet made have been so thorough as to make it certain that all dangers have been found. The number of the soundings is another method of estimating the completeness of the survey, remembering, however, that the chart is not expected to show all soundings that were obtained. When the soundings are sparse or unevenly distributed it may be taken for granted that the survey was not in great detail.

Large or irregular blank spaces among soundings mean that no soundings were obtained in these spots. When the surrounding soundings are deep it may fairly be assumed that in the blanks the water is also deep; but when they are shallow, or it can be seen from

the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion. This is especially the case in coral regions and off rocky coasts, and it should be remembered that in waters where rocks abound it is always possible that a survey, however complete and detailed, may have failed to find every small patch or pinnacle rock.

Fathom curves a caution.—Except in charts of harbors that have been surveyed in detail, the 5-fathom curve on most charts may be considered as a danger line, or caution against unnecessarily approaching the shore or bank within that curve on account of the possible existence of undiscovered inequalities of the bottom, which only an elaborate detailed survey could reveal. In general surveys of coasts, or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for so detailed a survey. It is not contemplated that ships will approach the shores in such localties without taking special precautions.

The 10-fathom curves on rocky shores is another warning, especially for ships of heavy draft.

A useful danger curve will be obtained by tracing out with a colored pencil, or ink, the line of depth next greater than the draft of the ship using the chart. For vessels drawing less than 18 feet the edge of the sanding serves as a well marked danger line.

Charts on which no fathom curves are marked must especially be regarded with caution, as indicating that soundings were too scanty and the bottom too uneven to enable the curves to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided, especially if ringed around, as it is doubtful how closely the spot may have been examined and whether the least depth has been found.

The chart on largest scale should ayways be used on account of its greater detail and the greater accuracy with which positions may be plotted on it.

Caution in using small-scale charts.—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in plotting a position means only yards on a large scale chart, whereas on one of small scale the same amount of displacement means a large fraction of a mile.

Mercator chart.—Observed bearings are not identical with those measured on the Mercator chart (execpting only the bearings north and south, and east and west on the equator) because the line of sight, except as affected by refraction, is a straight line and lies in the plane of the great circle, while the straight line on the chart (except the meridian line) represents, not the arc of a great circle, but the

loxodromic curve, or rhumb line, which on the globe is a spiral approaching but never in theory reaching the pole, or, if the direction be east and west, a circle of latitude.

The difference is not appreciable with near objects, and in ordinary navigation may be neglected. But in high latitudes, when the objects are very distant and especially when lying near east or west, the bearings must be corrected for the convergence of the meridians in order to be accurately placed on the Mercator chart, which represents the meridians as parrallel.

Polyconic chart.—On the polyconic chart, since a straight line represents (within the limits of 15 or 20 degrees of longitude) the arc of a great circle or the shortest distance between two points, bearings of the chart are identical with observed bearings.

The Mercator projection is unsuited to surveying, for which purpose the polyconic projection is used by the Hyrographic Office and the Coast and Geodetic Survey.

Notes on charts should always be read with care, as they may give important information that can not be graphically represented.

Current arrows on charts show only the most usual or the mean direction of a current; it must not be assumed that the direction of a current will not vary from that indicated by the arrow. The velocities, also, of currents vary with circumstances, and those given on the charts are merely the mean of those determined, possibly from very few observations.

Compass roses on charts.—The gradual change in the variation must not be forgotten in laying down on the chart courses and bearings from the magnetic compass roses, which become in time slightly in error, and in some cases, such as with small scales or when the lines are long, the displacement of position from neglect of this change may be of importance. The date of the variation and the annual change, as given on the compass rose, facilitate corrections when the change has been considerable. It is better to reduce all magnetic bearings and courses to true and then use the true compass rose.

The change in the variation for a change of position, is in some parts of the world so rapid as to need careful consideration, requiring a frequent change of the course. For instance, in approaching Halifax from Newfoundland the variation changes 10° in less than 500 miles.

Local magnetic disturbance of the compass on board ship.—The term "local magnetic disturbance" has reference only to the effects on the compass of natural magnetic masses external to the ship. Observation shows that such disturbance of the compass in a ship afloat is experienced in many places on the globe.

Magnetic laws do not permit of the supposition that the visible land causes such disturbance, because the effect of a magnetic force

diminishes so rapidly with distance that it would require a local center of magnetic force of an amount absolutely unknown to affect a compass ½ mile distant.

Such deflections of the compass are due to magnetic minerals in the bed of the sea under the ship, and when the water is shallow and the force strong the compass may be temporarily deflected when passing over such a spot; but the area of disturbance will be small unless there are many centers near together.

Aids—Buoys.—Too much reliance should not be placed on buoys always maintaining their exact positions. They should therefore be regarded as warnings and not as infallible navigational marks, especially when in exposed places and in the wintertime; and a ship's position should always, when possible, be checked by bearings or angles of fixed objects on shore.

The light shown by a light buoy can not be implicitly relied on; it may be altogether extinguished or, if periodic, the apparatus may get out of order.

Whistle and bell buoys are sounded only by the action of the sea; therefore in calm weather they are less effective or may not sound.

Lights.—All the distances given in the Light Lists and on the charts for the visibility of lights are calculated for a height of 15 feet for the observer's eye. The effect of a greater or less height of eye can be ascertained by means of the table of distances of possible visibility due to height, published in the Light Lists.

The loom of a powerful light is often seen far beyond the limit of visibility of the actual rays of the light, and this must not be confounded with the true range. Refraction, too, may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light the fact may be forgotten that aloft the range of vision is much increased. By noting a star immediately over the light a very correct bearing may be obtained from the standard compass when you lay down from aloft.

On first making a light from the bridge by at once lowering the eye several feet and noting whether the light is made to dip it may be determined whether the ship is on the circle of visibility corresponding with the usual height of the eye or unexpectedly nearer the light.

When a light is sighted it should be identified at once by checking its characteristics. This is particularly necessary when approaching well-lighted coasts, where lights with similar characteristics are often found close together.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by its candlepower or order, as given in the Light Lists, and in some cases by noting how much its visibility in clear weather falls short of the range corresponding to its height. Thus a light standing 200 feet above the sea and recorded as visible only 10 miles in clear weather is manifestly of little brilliancy, as its height would permit it to be seen over 20 miles if of sufficient power.

Sailing Directions or Pilots are books treating of certain sections or divisions of the navigable waters of the globe. They contain descriptions of coast lines, dangers and harbors, information of winds, currents, and tides, and directions for approaching and entering habors, and much other general information of interest to mariners.

The Sailing Directions are corrected, as far as practicable, to the date of issue from the office; they can not, from their nature and the infrequency of their revision, be so fully corrected as charts and Light Lists, and for that reason, when they differ the one of the most recent issue should be accepted as correct.

Light Lists, published about once a year, are corrected before issue, and changes affecting them are published in the weekly Notices to Mariners.

The navigator should make notations of corrections in the tabular form in the Light Lists and paste in at the appropriate places the slips from the Notices to Mariners.

Notices to Mariners, containing newly acquired information pertaining to various parts of the world, are published weekly and mailed to all United States ships in commission, Branch Hydrographic offices and agencies, and United States consulates. Copies are furnished free by the main office or by any of the branch offices on application.

With each Notice to naval vessels is sent also a separate sheet, giving the items relative to lights contained in the latest Notice, intended especially for use in correcting the Light Lists.

Pilot Charts of the North Atlantic, Central American Waters, and North Pacific and Indian Oceans are published each month, and of the South Atlantic and South Pacific Oceans each quarter. These charts give the average conditions of wind and weather, barometer, percentage of fog and gales, routes for steam and sailing vessels, ice, derelicts, ocean currents, storm tracks, and other useful information. They are furnished free only in exchange for marine data or observations.

Hydrographic Bulletins, published weekly, are supplemental to the Pilot Charts, and contain the latest reports of obstructions and dangers along the coast and principal ocean routes and other information for mariners. They are to be had free upon application.

The bulletins are supplemented by the Daily Memorandum published daily, Sundays and holidays excepted, in order that the information relating to dangers and aids to navigation received may be disseminated as quickly as possible.

Tides.— Aknowledge of the times of high and low water and of the amount of vertical rise and fall of the tide is of great importance in the case of vessels entering or leaving port, especially when the low water is less than or near their draft. Such knowledge is also useful at times to vessels running close along a coast, in enabling them to anticipate the effect of the tidal currents in setting them on or offshore. This is especially important in fog or thick weather.

Tidal currents.—In navigating along coasts where the tidal range is considerable, special caution is necessary. It should be remembered that there are generally indrafts and corresponding outdrafts abreast of all large bays and bights, although the general run of the current may be nearly parallel with the shore outside the entrances.

The turn of the tidal current offshore is seldom coincident with the times of high and low water along the shore. In some channels the tidal current may overrun the turn of the vertical movement of the tide by three hours, the effect of which is that at high and low water by the shore the current is running at its greatest velocity.

The effect of the tidal wave in causing currents may be illustrated by two simple cases:

(1) Where there is a small tidal basin connected with the sea by a large opening.

(2) Where there is a large tidal basin connected with the sea by a small opening.

In the first case the velocity of the current in the opening will have its maximum value when the height of the tide within is changing most rapidly, i. e., at a time about midway between high and low water. The water in the basin keeps at approximately the same level as the water outside. The flood current corresponds with the rising and the ebb with the falling of the tide.

In the second case the velocity of the current in the opening will have its maximum value when it is high water or low water without, for then there is the greatest head of water for producing motion. The flood current begins about three hours after low water, and the ebb current about three hours after high water, slack water thus occurring about midway between the tides.

Along most shores not much affected by bays, tidal rivers, etc., the current usually turns soon after high water and low water.

The swiftest current in straight portions of tidal rivers is usually in the middle of the current, but in curved portions the most rapid

current is toward the outer edge of the curve, and here the deepest water will generally be found. The pilot rule for best water is to follow the ebb tide reaches.

Countercurrents and eddies may occur near the shores of straits, especially in bights and near points. A knowledge of them is useful in order that they may be taken advantage of or avoided.

A swift current often occurs in a narrow passage connecting two large bodies of water, owing to their considerable difference of level at the same instant. The several passages between Vineyard Sound and Buzzards Bay are cases in point.

Tide rips are made by a rapid current setting over an irregular bottom, as at the edges of banks where the change of depth is considerable.

The Tide Tables, which are published annually by the United States Coast and Geodetic Survey, give the predicted times and heights of the high and the low waters for every day in the year at 81 of the principal ports of the world, and, through the medium of these by means of tidal differences and ratios, at a very large number of subordinate ports. The tables for the Atlantic and the Pacific coast ports of the United States are also published separately.

It should be remembered that these tables aim to give the times of high and low water, and not the times of turning of the current or of slack water, which may be quite different.

The distinction between "rise" and "range" of the tide should be understood. The former expression refers to the height attained above the datum plant for soundings, differing with the different planes of reference; the latter, to the difference of level between successive high and low waters.

Full explanations and directions for their use are given in the Tide Tables.

Fogsignals.—Sound is conveyed in a very capricious way through the atmosphere. Apart from the influence of the wind large areas of silence have been found in different directions and at different distances from the origin of sound, even in clear weather; therefore, too much confidence should not be felt as to hearing a fog signal. The apparatus, moreover, for sounding the signal often requires some time before it is in readiness to act. A fog often creeps imperceptibly toward the land, and may not be observed by the lighthouse keepers until upon them; a ship may have been for many hours in it, and approaching the land in confidence, depending on the signal, which is not sounded. When sound travels against the wind, it may be thrown upward; a man aloft might hear it though inaudible on deck.

The submarine bell system of fog signals is much more reliable than systems transmitting sound through the air, as sound travel-

ing in water is not subject to the same disturbing influences; the fallibility of the lighthouse keeper is, however, about the same in all systems, so that caution should be observed even by vessels equipped with submarine bell receiving apparatus.

Submarine bells have an effective range of audibility greater than signals sounded in air, and a vessel equipped with receiving apparatus may determine the approximate bearing of the signal.

These signals may be heard also on vessels not equipped with receiving apparatus by observers below the water line, but the bearing of the signal can not then be readily determined.

Vessels equipped with radio apparatus and submarine bell receivers may fix their distance from a light vessel having radio and submarine bell, utilizing the difference in velocity of sound waves of the radio and the bell. Sound travels 4,794 feet per second at 66° F. in water, and the travel of radio sound waves for practicable distances may be taken as instantaneous.

All vessels should observe the utmost caution in closing the land in fogs. The lead is very often the safest guide and should be faithfully used.

Radio compass stations.—Most valuable aids to navigation in a fog are the radio compass stations, which will fix a ship's position by two or more bearings from a single radio station, or by simultaneous bearings from two or more stations.

In localities where only one radio station is available mariners may use the single bearing like a Sumner's line of position, or a single bearing of any object whose position is known.

All reports from mariners indicate great accuracy in the bearings given by the radio station, and they should be used whenever available.

PILOTING—FIXING POSITION.

Piloting, in the sense given the word by modern and popular usage, is the art of conducting a vessel in channels and harbors and along coasts, where landmarks and aids to navigation are available for fixing the position, and where the depth of water and dangers to navigation are such as to require a constant watch to be kept upon the vessel's course and frequent changes to be made therein.

Piloting is the most important part of navigation and the part requiring the most experience and nicest judgment. An error in position on the high seas may be rectified by later observations, but an error in position while piloting often results in disaster. Therefore the navigator should make every effort to be proficient in this important branch, bearing in mind that a modern vessel is usually safe on the high seas and in danger when approaching the land and making the harbor.

The navigator, in making his plan for entering a strange port, should give very careful previous study to the chart and sailing directions, and should select what appear to be the most suitable marks for use, also providing himself with substitutes to use in case those selected as most suitable should prove unreliable in not being recognized with absolute certainty. Channel buoys seen from a distance are difficult to identify, because their color is sometimes not easily distinguished and they may appear equally distant from the observer even though they be at widely varying distances. Ranges should be noted, if possible, and the lines drawn, both for leading through the best water in channels, and also for guarding against particular dangers; for the latter purpose safety bearings should in all cases be laid down where no suitable ranges appear to offer. The courses to be steered in entering should also be laid down and distances marked thereon. If intending to use the sextant and danger angle in passing dangers, and especially in passing between dangers, the danger circles should be plotted and regular courses planned rather than to run haphazard by the indications of the angle alone, with the possible trouble from bad steering at critical points.

The ship's position should not be allowed to be in doubt at any time, even in entering ports considered safe and easy of access, and should be constantly checked, continuing to use for this purpose those marks concerning which there can be no doubt until others are unmistakably identified.

The ship should ordinarily steer exact courses and follow an exact line, as planned from the chart, changing course at precise points, and, where the distances are considerable, her position on the line should be checked at frequent intervals. This is desirable even where it may seem unnecessary for safety, because if running by the eye alone and the ship's exact position be immediately required, as in a sudden fog or squall, fixing at that particular moment may be attended with difficulty.

The habit of running exact courses with precise changes of course will be found most useful when it is desired to enter port or pass through inclosed waters during fog by means of the buoys; here safety demands that the buoys be made successively, to do which requires, if the fog be dense, very accurate courses and careful attention to the times, the speed of the ship, and the set of the current; failure to make a buoy as expected leaves, as a rule, no safe alternative but to anchor at once, with perhaps a consequent serious loss of time.

In passing between dangers where there are no suitable leading marks, as for instance, between two islands or an island and the main shore when the conformations of the shore line are very similar, with dangers extending from both, a mid-channel course may be

steered by the eye alone with great accuracy, as the eye is able to estimate very closely the direction midway between.

In piloting among coral reefs or banks, a time should be chosen when the sun will be astern, conning the vessel from aloft or from an elevated position forward. The line of demarcation between the deep water and the edges of the shoals is indicated with surprising clearness. This method is of frequent application in the numerous passages of the Florida Keys.

Changes of course should in general be made by exact amounts, naming the new course or the amount of the change desired, rather than by ordering the rudder to be put over and then steadying when on the desired heading, with the possibility of the attention being diverted and so of forgetting in the meantime, as may happen, that the ship is still swinging. The steersman, knowing just what is desired and the amount of the change to be made, is thus enabled to act more intelligently and to avoid bad steering, which in narrow channels is a very positive source of danger.

Coast piloting involves the same principles and requires that the ship's position be continuously determined or checked as the landmarks are passed. On well-surveyed coasts there is a great advantage in keeping near the land, thus holding on to the marks and the soundings, and thereby knowing at all times the position rather than keeping offshore and losing the marks, with the necessity of again making the land from a vague position, and perhaps the added inconvenience of fog or bad weather, involving a serious loss of time and fuel.

The route should be planned for normal conditions of weather, with suitable variations where necessary in case of fog or bad weather or making points at night, the courses and distances, in case of regular runs over the same route, being entered in a notebook for ready reference, as well as laid down on the chart. The danger circles for either the horizontal or the vertical danger angles should be plotted, wherever the method can be usefully employed, and the angles marked thereon; many a mile may thus be saved in rounding dangerous points with no sacrifice in safety. Ranges should also be marked in, where useful for position or for safety, and also to use in checking the deviation of the compass by comparing in crossing the compass bearing of the range with its magnetic bearing, as given by the chart.

A continuous record of the progress of the ship should be kept by the officer of the watch, the time and patent log reading of all changes of course and of all bearings, especially the two and four point bearings, with distance of object when abeam, being noted in a book kept in the pilot house for this special purpose. The ship's reckoning is thus continuously cared for as a matter of routine and

without the presence or particular order of the captain or navigating officer. The value of thus keeping the reckoning always fresh and exact will be especially appreciated in cases of sudden fog or when making points at night.

Where the coastwise trip must be made against a strong offshore or head wind, it may be desirable, with trustworthy charts, to skirt the shore as closely as possible in order to avoid the heavier seas and adverse current that prevail farther out. In some cases, with small ships, a passage can be made only in this way. The important saving of coal and of time, which is even more precious, thus effected by skillful coast piloting makes this subject one of prime importance to the navigator. However, many vessels have gotten into serious trouble by attempting to save time and cut down distances by rounding too closely dangers and aids, and navigators should always bear in mind that the safety of the vessels is the first consideration.

Fixing position.—A navigator in sight of objects whose positions are shown on the chart and which he can recognize may locate his vessel by any one of the following methods:

1. Sextant angles between three known objects.
2. The bearing of a known object and angle between two known objects.
3. Cross bearings of two known objects.
4. Two bearings, of a known object, separated by an interval of time, with the run during that interval.
5. The bearing and distance of a known object.

Besides the foregoing there are two methods by which, without obtaining the precise position, the navigator may assure himself that he is clear of any particular danger.

1. The danger angle.
2. The danger bearing.

These various methods are fully explained in most textbooks on navigation and in Bowditch's American Practical Navigator, a copy of which should be in the navigator's outfit.

The first method of fixing the position, by the "three-point problem," is the most accurate of all methods, but requires expertness in the use of the sextant and protractor. However, the choice of the method should be governed by circumstances, depending upon which is best adapted to prevailing conditions.

Soundings are of very great advantage when approaching land or shoal banks in determining the position, and the convenience in the use of modern sounding machines renders any neglect to take soundings inexcusable.

Soundings taken at random are of little value in fixing or checking position and may at times be misleading. In thick weather, when near or closing the land, soundings should be taken continu-

ously and at regular intervals, and, with the character of the bottom, systematically recorded. By laying the soundings on tracing paper, according to the scale of the chart, along a line representing the track of the ship, and then moving the paper over the chart, keeping the line representing the track parallel with the course until the observed soundings agree with those of the chart, the ship's position will in general be quite well determined.

At sea the only methods of determining the position of the vessel are by "dead reckoning" and by observations of heavenly bodies, though observations may be made use of by various methods. (See American Practical Navigator and textbooks on navigation.)

The one which should be best understood and put to the most constant use is that employing position or summer lines. These lines give the most comprehensive information to the navigator with the least expenditure of labor and time. The knowledge gained is that the vessel must be somewhere on the line, provided the data used is accurate and the chronometer correct. As the information given by one line of position is not sufficient to determine the definite location of the vessel, it is necessary to cross this line by another similarly obtained, and the vessel being somewhere on both must be at their intersection. However, a single line, at times, will furnish the mariner with invaluable information; for instance, if it is directed toward the coast it marks the bearing of a definite point on the shore, or if parallel to the coast it clearly indicates the distance off, and so will often be found useful as a course. A sounding taken at the same time with the observation will in certain conditions prove of great value in giving an approximate position on the line.

The easiest and quickest way to establish a line of position is by employing the method of Marcq St. Hilaire, as modified by the use of tables of altitude.

A very accurate position can be obtained by observing two or more stars at morning or evening twilight, at which time the horizon is well defined. The position lines thus obtained will, if the bearings of the stars differ three points or more, give an excellent result. A star or planet at twilight and the sun afterwards or before may be combined; also two observations of the sun with sufficient interval to admit of a considerable change of bearing; in these cases one of the lines must be moved for the run of the ship.

Use of oil for modifying the effect of breaking waves.—Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skillfully applied, may prevent much damage both to ships espe-

cially of the smaller classes, and to boats by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:

1. On free waves, i. e., waves in deep water, the effect is greatest.

2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when no other oil is obtainable, or it may be mixed with other oils; all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. In cold water, the oil, being thickened by the low temperature and not being able to spread freely, will have its effect much reduced. A rapid spreading oil should be used.

5. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

6. It is useful in a ship or boat either when running, or lying-to, or in wearing.

7. When lowering and hoisting boats in a heavy sea the use of oil has been found greatly to facilitate the operation.

8. For a ship at sea the best method of application appears to be to hang over the side, in such a manner as to be in the water, small canvas bags, capable of holding from 1 to 2 gallons of oil, the bags being pricked with a sail needle to permit leakage. The waste pipes forward are also very useful for this purpose.

9. Crossing a bar with a flood current, to pour oil overboard and allow it to float in ahead of the boat, which would follow with a bag towing astern, would appear to be the best plan.

On a bar, with the ebb current running, it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside, bearing in mind that her natural tendency is always to forge ahead. If she is aground the effect of oil will depend upon attending circumstances.

11. For a boat riding in bad weather to a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil can be diffused well ahead of the boat, and the bag readily hauled on board for refilling, if necessary.

Chapter I.

GENERAL REMARKS—SOUNDINGS—WINDS—CLIMATE—TEMPERATURE—RAINFALL—FOG—BAROMETER—CURRENTS—TIDES—TIDAL CURRENTS—PILOTS—COMMUNICATIONS—PASSAGES.

Physical geography—Persian Gulf.—The Persian Gulf lies between the parallels of 24° and 30° north latitude and the meridians 48° and 57° east longitude. From the coast of Oman the gulf extends northwestward about 460 miles to the entrance to the Shatt al Arab, and it has an average width of about 120 miles, though its entrance, between Ras Musandam and the coast to the eastward, is only 29 miles wide.

The Persian coast, or the northeastern shore of the gulf, is mountainous, with deep water generally close-to. The Arabian coast, or the southeastern and southwestern shores, with the exception of the northwestern side of the Oman Peninsula, is exceedingly low, and reefs and shoals extend from 30 to 50 miles off it in places for nearly its whole length. Vessels, therefore, navigating up and down the gulf always keep toward the Persian coast.

The northern end of the Persian Gulf is probably silting up gradually, owing to the great amount of alluvium it receives from the large rivers debouching there. The water of the upper part of the gulf is much salter than that of the ocean.

The southwestern and southeastern shores of the gulf, from the Shatt al Arab to the Ruus al Jebel, are mostly a desert of white sand, with extensive tracts quite uninhabited. Near the villages, or where there are any people, there are generally more or less extensive date groves.

Navigation on the southwestern shore, between the Shatt al Arab and Oman, is seldom attempted at night; vessels should anchor at dusk, if possible.

The head of the gulf is low alluvial land.

The northeastern shore of the gulf, from the delta of the Shatt al Arab and other rivers to Ras al Kuh, presents a series of rugged and precipitous mountain ranges, generally running nearly parallel to the shore.

The mountain ranges increase in height as they recede inland, and, being visible from great distances, are good marks. Wide valleys separate the mountains, and there are belts of lowland of varying

width between them and the sea, which are called by the Persians the Garmsir, or winter pastures, and, being at the southern foot of the mountains, and watered by no river, are very hot in summer.

There are numerous islands of various sizes in the Persian Gulf; the two largest are Kishm, 60 miles long and 19 miles broad, just within the entrance, and Bahrein, off the southeastern shore, 27 miles long and 10 miles broad, while some are mere sand islets. Many are, at least partly, of volcanic origin. There are anchorages at most of the islands, sheltered from some directions, but in winter, as the wind may then suddenly shift to the opposite quarter, a sailing vessel should anchor in a position from which she could move at the first sign of a change.

Ports.—The sea-borne trade of Persia passes chiefly through the ports of Bandar Abbas, Abu Shahr (Bushire), Basra, and Muhammera (via Bagdad). There is also considerable trade at Bahrein, Kuweit, Basidu, and Linga.

Towns.—The small towns on the shores of the Persian Gulf are all very similar; a square fort of rough stones with loop-holed towers at the angles, or several detached round towers; the Shaikh's house, and perhaps one or two others, of stone, the remainder of mats made of date-leaf stalks; a date grove in the immediate vicinity, and a detached tower or two near the wells, are the invariable components. They are generally situated near a small creek or backwater, where there is a smooth place for hauling up the boats. The large towns are sometimes walled around and have a larger proportion of stone buildings, but there are no pretensions to architecture and seldom more than two stories to the houses.

The guns mounted in Arab fortifications are, almost without exception, old and useless.

The mariner may find that towns and villages herein mentioned have disappeared and others not mentioned have sprung up. New places frequently originate through the secession of families who, being dissatisfied with the chief of their own tribe, emigrate and build a town of their own. Many islands and also villages, which were abandoned when piracy flourished, are being gradually reoccupied.

The water reservoirs are often prominent in the towns, or in their vicinity, on the Persian coast; they are either oblong and arched over, or circular and covered with domes; being white, they are often conspicuous from seaward, especially those with domes.

Population.—The population of the Arabian coast is exclusively Arab; in the towns they can be trusted, but it is not safe to land unarmed on the mainland, on account of the Bedawin, who may be occasionally met, and who, for the sake of plunder, attack even their own countrymen of the towns.

Estimates of the population are untrustworthy and difficult to make; people on the Arabian coast are said to number 200,000, about one-third of whom are engaged in the pearl fishery during its season. and quite half the population is directly or indirectly supported by that industry. The natives always reckon population by the men only, and give vague guesses when inquiries are made. The numbers given herein for the villages and smaller towns are mostly calculated on the basis of the number of houses in a place, or of the boats belonging to it, or from information given by the more intelligent men.

Supplies.—The people are generally very poor, and can offer but few supplies. Throughout the Persian Gulf, except at its head, there are no streams of any importance, and the fresh water is generally rain collected in wells or reservoirs; it is usually both scare and bad, but is best in quantity and quality after the winter rains; a vessel must take it off in her own boats. Wood is scarce.

Health.—In the cold season, fevers are most prevalent; the so-called gulf fever of the remittent type is very dangerous, and convalescence can only be obtained by leaving the gulf. Yellow fever is unknown.

Cholera, plague, and smallpox are frequent; a small encampment a short distance from an Arabian town is often a kind of lazaretto for smallpox, and should be avoided by parties landing. Ophthalmia is common among the natives.

The hot season does not seem to be absolutely unhealthy; seamen suffer from aggravated prickly heat, boils, etc., but if they are kept out of the sun and ventilation is attended to there will probably be but little serious sickness. As little work should be done aloft by day as possible; awnings must be spread, and the men should sleep on deck, where the dew does not appear to have an injurious effect. Absolute necessity alone can justify the exposure of the men to the sun, and white hats should be insisted on.

Trade.—In normal times the principal trade of Persia was an inland trade on northern and northwestern boundaries and was chiefly in the hands of Russian merchants. Russia had 55.7 per cent and the British Empire 27.85 per cent of the total trade, Turkey, France, and Italy being next in order, and the trade of other nations inconsiderable. The British portion of the trade was mainly with British India and via the three ports of Abu Shahr, Linga, and Bandar Abbas.

The principal articles of export via the Persian Gulf and through the places just mentioned are pearls, wool, cotton, carpets, hides, dried fruits, including dates, almonds, gum, wheat, tobacco, rose-

water, horses, etc. The imports are mainly cotton and woolen goods, arms, metal articles, tea, sugar, kerosene, coffee, indigo, etc.

The direct trade between England and Basra is carried on by English firms at Bagdad via the Suez canal, the lines of steamers touching at Aden, Maskat, and Abu Shahr en route.

Steam vessels conduct most of the traffic between the principal ports of the gulf and have almost monopolized the trade from them to India. Local traffic is carried on by native craft.

Products.—The great heat of summer is very favorable to the growth of dates, which fruit forms the staple food of the Arabians. Those grown near the Shatt al Arab, said to be the finest in the world, are sent to all parts of Asia; also to Europe and to America; quantities are also exported from the Bátina coast.

Corn and a few asses are exported to Mauritius from Maskát; also salt and salt fish. Shark fins, etc., are sent to India for the China market. Salt and a little sulphur are also exported.

Pearl fishery.—Pearls are the most important export of the Persian Gulf, and the fishery gives employment to the greater part of the maritime population. In 1905 about 3,411 boats, with crews numbering in all 64,390 men, were engaged in this fishery; of this number no less than 2,395 boats, with crews amounting to 47,635, were under British flag, the other half under Turkish jurisdiction. The boats vary in size from 10 to 50 tons, and their crews from 8 to 30 men.

The chief pearl market for the northern half of the gulf is at Al Menama, at the northern end of Bahrein island; and for the southern part at Dibai, on the Oman coast. Nearly all the pearls pass through the hands of wealthy Arabian merchants residing at Linga and Kais on the Persian, and at Bahrein, Abu Thabi, and Sharja on the Arabian side, by whom they are exported in the first instance to Bombay, where they are sorted and classified by the dealers for the markets of the world.

There are three seasons for the fishery, the first, known as the Ghaus-al-Kabir, lasts 130 days, from about the second week of May to the third week of September, during which time it is pursued with the greatest assiduity. During September, when the date harvest also occurs, the towns and villages are nearly deserted. The second season is the "Radda," which begins a few days after the Ghaus-al-Kabir. The third is the cold weather season, conducted by wading in the shallows along the coast at low water; the pearls thus obtained are generally small, discolored, and of comparatively little value.

The pearl banks appear from time immemorial to have been open without distinction to the Arabians of the entire littoral, and it would be futile here to attempt to specify any definite tribal limits, but the external boundaries are well known, and all intrusion is resented.

Nearly all the towns on the Arabian side, and many on the Persian, send boats to the fishery.

The fishery is pursued on any banks where the bottom is hard and level without rugged rocks; the average depth is 8 fathoms and the extreme depth about 14 fathoms. The general Arabian name for such a bank is "heir." Of these banks, the names and positions of no less than 184 are known between Dibai and Ras Tanura, or between the parallels 24° 10′ and 27° north latitude, and the meridians 50° and 55° east longitude, whilst there are also 217 banks known to the fishermen, and 24 different descriptions of pearls. The longest time a diver can remain under water does not exceed one minute and a half, and but few exceed one minute.

In the cold season, a few large boats leave Bahrein and the ports of Oman to fish for pearls at Sokotra, and also on the northeast coast of Africa, returning in time for the fishing season in the gulf. A large trade has sprung up in mother of pearl, the oyster shells, formerly considered valueless, being now exported, chiefly to Europe.

Gulf of Oman.—The Gulf of Oman, situated between Oman and Persian Makran, is the approach to the Persian Gulf. It is about 180 miles wide at its entrance between Ras al Hadd and Ras Fasta, the western point of Gwatar Bay, and it extends about 275 miles northwestward to Musandam Island. It is generally clear of outlying shoals and has deep water near its shores, which, on both sides, are backed hy high mountains.

There are a few small islands off the Arabian coast near Maskat, and about 30 miles northwestward of it.

Oman ('Oman) is a Muhammadan State comprising the country on the southwestern side of the Gulf of Oman, from Ras al Hadd up to the entrance to the Persian Gulf. It is under the Sultan of Maskat, but the extent of his dominions is practically limited by the distance to which he can enforce his authority, which is generally only near the coast. The interior of the country is arid, desert, and mountainous, but the Batina, a wide plain extending from the coast to the foot of the mountains for about 150 miles northwestward of Maskat, is fertile, and produces much fruit, grapes, limes, peaches, apples, etc.; there are also numerous date trees. The population is estimated at about 500,000, a considerable portion being nomadic, and the people are for the most part poor. Though mainly consisting of Arabs, there is a considerable admixture of foreigners, such as Banyans and Khojahs from India, Persians, East Africans, and Nubians, the people of mixed races being generally found in the larger towns.

Maskat is the capital and principal port of Oman, being the only port of call for steamers, but it has no communication with the interior, from its being surrounded by high rocky hills, and Matra,

about 2 miles to the westward, supplies this want, and is the local center for the inland trade.

Government.—The Government of Oman is absolute, and somewhat primitive. There are no law courts in the European sense; cases are usually decided by the Sultan and his Walis in accordance with Muhammadan law or local custom. Commercial law does not exist, and claims against Arab subjects are difficult to settle.

The Government has treaties with Great Britain, France, and the United States.

The army, consisting of a small force of Arabs, Makranis, and Wahabis, armed with modern rifles, garrisons the Sultan's forts and possessions; the fortifications are in a dilapidated condition. The Sultan has one steamer.

The language of Oman is Arabic; many persons in Maskat and Matra speak Persian, Baluchi, and Hindustani. Business communications can, however, be sent in English.

Trade.—Dates (the staple food product) are the chief exports, and rice, wheat, coffee, cotton and silk goods, kerosene, twist and yarn, are the chief imports.

Las Beila and Makran.—Las Beila (Bela) (Bailah) is the southeastern, and Makran the southwestern, division of the native State of Kalat in Baluchistan. The seaboard of Las Beila extends from the Hab River, the boundary of British India, 4 miles northeastward of Ras Muari, northward to Sonmiyani Harbor, and thence westward to Khur Kalmat in long. 64° 4′ E.; that of Makran continues westward from Khur Kalmat to Gwatar Bay. Makran is generally known as Kech Makran, to distinguish it from Persian Makran, which lies between it and the entrance to the Persian Gulf.

The Kalat State consists of a confederacy of tribal groups headed by the khan of Kalat; the khan is assisted in the general administration of his State by a political adviser, lent by the British Government. Las Beila is under a chief known as the jam, and Makran is under the control of an officer known as the nazim. Gwadar Town and Port, with an area of about 307 square miles around, is held by the sultan of Maskat.

The coast from Sonmiyani trends westward nearly 500 miles to Jashk. Owing to the small rainfall, the salt nature of the soil, and the physical conformation of the country, it is almost entirely desert, presenting a succession of arid clay plains impregnated with saline matter and intersected by water courses. From these plains rise precipitous table-hills, with fantastic peaks and pinnacles, varying in height from 2,050 feet at Ras Malan to hillocks of 20 or 30 feet.

Farther inland other ranges of mountains of varying height extend parallel with the coast, and all appear to be without vegetation.

The coast is barren and deeply indented with bays, but its most characteristic feature is the repeated occurrence of promontories and peninsulas of white clay cliffs capped with coarse limestone or shelly breccia, all approaching the table-topped form. The intermediate coast is low, sometimes with high white sand hills, or low sand hills with small bushes and tufts of grass; in many places the coast is a mere strip of very low sand, with extensive salt-water swamps behind. Owing to the excessive lowness of such parts of the coast, the distance from it is very liable to be dangerously overestimated.

There is no vegetation except here and there a clump of date trees, in the vicinity of a village or settlement, around which there may be some small amount of cultivation. There are no perennial rivers in Makran, and, near the sea, the streams, which are frequently dry or nearly so except after rain, become salt-water creeks, only navigable by small boats.

The only fresh water is rain collected in shallow wells or reservoirs. There are no regular harbors on the Makran coast, though there are many roadsteads or anchorages where shelter may be obtained from winds in some direction.

Churna, Astola, and an islet in Gwatar Bay, are the only islands off the Makran coast; they are very small, but are good marks. The coast is unusually clear of outlying shoals.

The principal ports are Pasni and Gwadar.

Population.—The population is everywhere sparse; Las Beila contains about 56,000, and Makran was estimated to contain about 78,000; in Las Beila are Jats, called Lasis, and in Makran many mixed races occur, varying both in physical and moral qualities. They are poor, simple, and primitive; hospitable to strangers, and faithful in the performance of duty. They can endure fatigue and privation, and are friendly with and accustomed to Europeans. The language is a dialect of Persian, and approximates the more nearly to that tongue as the western frontier is approached; it is hardly a written language, Persian being generally used in correspondence.

The small seaport towns are chiefly inhabited by Arabs, who originally came from the Arabian coast and formed settlements. In the larger places an admixture of Persians is found, also Banyans from Sind or Kutch, by whom the very limited trade of the country is chiefly carried on. The rural population is almost exclusively Persian, but Persians do not take to the sea, and all craft sailing from Persian ports are manned by Arabs.

The people live in mat huts, which are easily moved, so that a village is often merely a temporary encampment. In more permanent settlements there is a tower or fort in addition to the huts, and it is only at the towns of Sonmiyani, Ormara, and Gwadar that masonry or mud houses are found.

Trade.—The maritime trade is carried on by the vessels of the British India Steam Navigation Co., as well as by native craft. The native craft are called dangi, machwa, and batíl; the largest are about 80 tons, and trade to the Persian Gulf, Maskat, Karachí, Bombay, and a few to the Malabar coast; they are all lateen-rigged.

The exports consist chiefly of salt fish, fish maws, shark fins, ghí, raw wool, goats' hair, hides, cotton, dates, and dwarf palm, raw and manufactured; the imports of cotton piece goods, silks, sugar, wheat, rice, iron, juári, country oil, and kerosene.

The sea near the coast abounds with excellent fish, which forms the chief food of the maritime population, and is largely salted for export; it can generally be obtained cheaply from any of the numerous fishing boats.

Camels are bred in large numbers, and also sheep and goats, but they are not exported. Trade with the interior is very limited on account of the insecurity of the roads; it is carried on chiefly by camels, but sometimes by donkeys, which come to Sonmiyani, Ormara, Pasni, and Gwadar.

The trade of Persian Makran is trifling, and is carried on by Maskat boats, which visit the coast for salt, fish, pish, ghí, and a little wool.

Formerly Gwadar was the port from which nearly all the trade was carried, but since 1903, when the British India Steam Navigation Company's steamers commenced to call at Pasni, a good deal of the trade has been diverted to that port.

Currency.—The silver kran is the current coin in Persia. The exchange varies greatly, and is not the same at different places. There are nickel coins of the value of one-tenth and one-twentieth of a kran, the latter being named shahi.

The tuman (silver) is a money unit equivalent to 10 krans.

There is no national Arabian coinage; the current money is the Indian rupee, and the Austrian Theresa dollar. The Government rate of exchange varies.

The copper coins used are the pice of India, which pass at Maskat at an arbitrary fluctuating value.

The principal Turkish coins are the gold lira of 100 piastres, and the silver majidi (5½ to the lira). There are also smaller coins.

See also Maskat and the principal ports in the Persian Gulf.

The Indian rupee passes current everywhere, and vessels should be provided with it, or be able to draw bills on Bombay, which are generally at a premium at Abu Shahr (Bushire).

English gold could be changed by the English merchants at 'Abu Shahr or at Basra, probably at a premium.

On the Makran cost the Indian rupee and copper pice, the Maskat dollar, and Persian kran all pass current, the latter chiefly in the western districts. The Indian coinage is now probably best known.

Weights and measures.—The unit of weight in Persia is the miskal (71 grains). Most articles are bought or sold by a weight called batman or man, nominally of about £6.547 English; but the weights and measures in use in the country are not uniform. For the weights used at the principal ports in the gulf, *see* places.

The Indian maund, or English weights, are understood at the telegraph stations on the Makran coast.

The liquid measure is the English gallon in dealings at Abu Shahr, Basidu, etc., where the people are accustomed to deal with English vessels.

Water is charged for per cask, according to distance brought, from 1 to 2½ krans per hogshead (54 gallons).

The chief Persian standard of measure is apparently the farsakh, of 6,000 zar of 40.95 inches=3.87 miles; it is the distance that can be covered by a baggage animal in an hour. Some calculate the farsakh at 6,000 zar of 44.09 inches=4.17 miles.

The Arabians have no definite measure of distance, which is by them most vaguely estimated.

In the Turkish ports the weights are: 6.1084 miskals=1 ounce; 16 miskals=1 seer; 10 seers=1 charak; 4 charaks=1 Tabriz man (6.54 pounds); 342½ Tabriz mans=1 English ton. Also an board ship and for tea: 1 oke or hukka=2.84 pounds; 800 okes=1 English ton; 1 kharwar (654 pounds)=100 Tabriz mans; one tagar=1½ English tons. There are also others. The measures are: 1 dra=19 inches; 6½ dras (10 feet 3½ inches)=1 gusba.

Soundings.—The soundings in the Gulf of Oman and Persian Gulf are generally deep off high coasts, but less off low coasts.

The Gulf of Oman is very deep in the middle, and the greatest depth is 1,920 fathoms off Maskat; the 100-fathom curve is, on an average, from 10 to 15 miles from the shore, but it is closer in places. Toward the entrance to the Persian Gulf the depth decreases to 70 and 50 fathoms, but near Musandam there is a small area with a depth of more than 100 fathoms.

Within the Persian Gulf, the depth rarely exceeds 40 or 50 fathoms, and it decreases to 30 and 20 fathoms toward the head; on the pearl banks, which occupy about one-third of the area of the gulf, the depth is less than 20 fathoms. Across the head of the gulf, the 20-fathom curve is about 50 miles distant from the entrances to the rivers. Within the 20-fathom curve, especially off the Arabian coast, the soundings are irregular, with shallow banks and shoals.

Off the Persian coast and in the deep part of the gulf, the bottom is generally mud; on the pearl banks, hard sand, coral, and rocks; and off the Arabian coast, frequently white clay, especially to the northward of Bahrein.

Off the Makran coast and westward of the great bank off the Indus (long. 65° 50′) the bank of soundings extends from 25 to 5 miles, when it generally falls abruptly. The soundings are fairly regular, the bottom being rock, sand, and mud near the land and mud or clay in depths over 12 fathoms; as a rule the increase in depth is gradual up to 20 fathoms, when it becomes very rapid.

Winds—Shamal.—The prevailing wind in the Persian Gulf is the northwester, called by the natives shamal. The direction of this wind changes with the trend of the coast. A shamal may be expected at Jashk about three days after it sets in at Abu Shahr.

On the Arabian coast its average direction is from north to north-northwest, and on the west coast of Oman west-northwest, shifting to southwest near the entrance to the gulf.

On the Persian coast its direction is northwesterly southeastward to Ras Jabrin; northwest to west-northwest, thence to Jezirat Sheikh Shuaib; westerly off Jezirat Kais; and west to southwest from Jezirat Farur to the entrance to the gulf.

In the northern half of the Persian Gulf the shamal blows about nine months in the year and is sometimes very strong in April. It is almost incessant during June and part of July (called the barih or 40-days' shamal), seldom exceeding a moderate gale in force and at times quite light. Its general duration is three days, but it may last seven days. The worst shamals often last only one day, and sometimes only a few hours.

During a shamal the air is generally very dry, with a cloudless but generally the air is so loaded with dust from the Mesopotamian deserts that it is very thick. This makes navigation very dangerous, the white surf on the beach being often seen, while the land is obscured. In the Shatt al Arab it is often so thick that neither bank of the river is visible. Far off the land vessels' decks and rigging become coated with a fine impalpable dust.

During a shamal the air is generally very dry, with a cloudless sky, but in the winter these winds are sometimes attended by rain squalls, and often with thunder and lightning. The wind veers a few points during the 24 hours, blowing more off the Persian coast at night and more from the sea by day. A shamal may set in at any hour of the day or night, and generally does so suddenly.

In winter, during a kaus or southeasterly gale, be prepared for a sudden shift to the northwest, especially at night, as the shamal is then often very strong.

The worst of the shamal is usually soon after the beginning, but the shamal of from two to three or five days' duration has been found, sometimes, to be strongest about the middle of its continuance. The shamal does not always extend over the whole gulf, and often

lulls for a short time about daylight. In summer, shamals rarely exceed the force of a moderate gale (7), but in winter they are often fresh gales (8) or at times hard gales (9). It is generally advisable for a steam vessel of small power to obtain anchorage, if possible, during the strength of a shamal, as little or no headway will be made against it; the Persian coast and islands offer many suitable places of shelter.

A heavy swell from the northwest, especially in the southern part of the gulf, is often the precursor of a shamal, although such a swell sometimes occurs without any wind following it.

Some of the severest winter shamals set in during fine weather, and give no warning except a heavy bank in the northwestern quarter an hour or two previously, which rolls down, and the air gradually becomes thick, though this sometimes occurs without any wind following. Such a warning should, however, not be neglected.

The barometer, as a rule, does not give any warning of the approach of a shamal; if it was low before, it begins to rise as soon as the shamal sets in, but generally not before, and continues high during the gale. It sometimes falls before a bad winter shamal, but rises again after the first burst of the gale. The barometer sometimes is not affected by a heavy shamal, either before, during, or after it. The breeze is occasionally preceded by the absence of dew, or by the cessation of moisture in the air; either of which are tolerably sure signs.

Kaus.—During the winter, southeasters, called by the natives kaus, or sharki, alternate with the shamals; they also follow to a certain extent the trend of the coast, but only have any great force from December to April.

The kaus is generally accompanied by thick, gloomy weather, with hard squalls, often much rain, and sometimes thunder and lightning. It seldom lasts more than 3 days, and its strength is generally a moderate gale (7), but at times it is a fresh, or even hard gale (8 or 9); the strongest often last only one day. This wind is generally strongest on its last day.

When the wind veers to the southward the kaus is over, and is often succeeded almost immediately by a shamal, or it may blow hard for a short time from south or southwest, and so die away, no shamal occurring for several days. Sometimes, however, after blowing hard from southwest the wind shifts suddenly to northwest, and a strong shamal follows.

The atmosphere is moist and the barometer generally low. In winter, with a falling barometer and cloudy threatening weather, a kaus may be expected, but timely warning is not invariably given, though the barometer always falls during the gale, if not before.

A vessel anchored for the kaus in an anchorage open to the shamal should weigh immediately the kaus is over, or she may have to ride out a shamal on a lee shore. Easterly winds are of most frequent occurrence in the southern part of the gulf.

Nashi.—In winter, especially in the southern part of the gulf, strong northeasterly winds, called nashi, are experienced; they are accompanied by dark cloudy weather, and generally rain. The natives make a distinction between this wind and the kaus. The air is sometimes thick before a nashi, caused by the dust blown off the land. The wind often blows from three to five days, but frequently only one day; after the first day the air becomes clearer, possibly owing to rain on the land. The nashi blows in gusts with frequent lulls, and, if lasting three days, is strongest on the third day.

The barometer is not affected by a nashi, being generally high; but if so, it falls a little when the wind is over.

Suhaili.—The southwester, called by the natives suhaili, is much feared by them, as it blows into nearly all the sheltered anchorages on the Persian coast. It lasts generally only a few hours, and often follows the kaus, but sometimes occurs after fine weather; it is accompanied by rain, and is preceded by masses of clouds rising from the south, with lightning. It occurs infrequently, and only in winter, but it blows all over the Persian Gulf.

Squalls.—At the change of the seasons in autumn, very severe squalls may be expected, called "laheimar" by the Arabians. The air is often very clear about the time of these squalls, and it does not appear that they are from any special direction. According to the Arabians they are experienced between the 15th of October and the 5th of November, during which time no native vessels put to sea until a squall is over. If they do not occur before the 5th of November, the Arabians consider that there will be none until the ordinary bad winter weather sets in. An unusual degree of electrical action is noticed, and St. Elmo's lights have been observed on board ship at this season.

In Basidu Road very violent squalls are experienced from the northward in May and from the southeastward in July, but these are not of frequent occurrence. Very heavy squalls from the northward are experienced in May near the head of the gulf.

In winter, especially, tremendous gusts blow out of the Devils Gap, the great valley in the mountains south-southeastward of Maskat.

Alternating winds.—A succession of squalls from opposite quarters, each lasting only a few minutes, and alternating thus several times, is occasionally experienced.

Land and sea breezes.—These are uncertain. In fine weather very decided land breezes are experienced, but only close inshore.

At Abu Shahr, sea breezes are very regular in summer, setting in, when there is no shamal, at 9 h. a. m.; the land breezes are very light and of short duration.

At Basidu, land breezes are strong and last until 10 h. a. m.; sea breezes are also regular, but do not set in so early as at Abu Shahr.

On the Arabian coast, the land breezes are often strong in the morning, and come off occasionally in hot gusts. At Kuweit, the sea breezes are regular in fine weather.

General remarks.—In winter the winds are often very local, a shamal blowing at one end of the gulf, while at the other end, or in the central part, the wind is from the opposite direction, or it is calm.

At Abu Shahr, the wind often blows in the opposite direction to that in the Shatt al Arab.

Gulf of Oman.—The southwest monsoon is not felt inside Ras al Hadd. From about June to September light variable winds prevail westward of a line between Ras al Hadd and Cape Jashk, and southeasterly winds, force 2 to 3, eastward of this line; shamals rarely occur; calms are frequent and of short duration. Occasionally very hot, dry northwesterly winds, lasting not more than a day, have been experienced in the gulf. The passage of a sailing vessel out of the gulf is very tedious. The sea is generally smooth, with a slight swell in the eastern part.

During the northeast monsoon, shamals and nashis prevail, but calms are frequent and sometimes last for days. The general direction of the shamal is northwest. The nashi blows very hard in the gulf, and is much dreaded by native craft, as the Batina coast is to leeward and affords no shelter. The suhaili occurs infrequently, but it is especially felt off Ras al Kuh. Seamen say that there is either too much wind or none at all in the gulfs, and this is nearly moderate, steady breezes being almost unknown.

Makran coast.—The southwest monsoon commences in the Arabian Sea in May, and sets in at Karachi generally between the 6th of June and 10th of July, with a few days' or even a fortnight's hard blow from between southwest and west-southwest, cloudy weather and scud flying overhead. It is announced by a falling barometer, and is accompanied or preceded by a heavy swell from the same quarter.

After the first blow, it moderates, when strong to light breezes prevail until the end of August or sometimes the middle of September, the wind veering at night several points to the westward. The swell continues, and varies from a high to a long low swell, according to the weather. Soon after the middle of July there is a lull, clouds bank up with lightning in the east, and sometimes during a heavy squall, accompanied by torrents of rain, the wind

shifts to the westward. The weather from May to September is very hazy, so that the land is often not seen until close to.

At Gwadar, the wind is not so strong as at Karachi, and the swell is longer and more from the southward; westward of Gwadar the wind decreases, and at Cape Jashk is a light southerly to southeasterly breeze, accompanied by a long ground swell causing surf on the shore.

The monsoon rains do not appear to extend westward of Ormara.

Land and sea breezes prevail on the coast in winter; the land breeze sets in at midnight, or some hours later, from between north-northeast and east-northeast, and veering gradually eastward, is followed by a calm before noon, or by a light southeasterly air which veers to southwest in the afternoon. The land breezes prevail from October to February, and are often fresh or strong in November, December, and January. After January they are weak and uncertain, and in April are sometimes felt as hot winds. The sea breezes are light from October to January, and increase in strength as the season advances, being strong in April and May; they veer several points off the land at night, and are light or fail in the morning.

Northeasters.—During December and January strong northeasters are frequently experienced, accompanied by clouds of dust, and often by gloomy squally weather, with rain about the end of the year. They last sometimes two or three days, in which case the wind generally lulls in the afternoon, freshening again at night.

Shamals are experienced at all times of the year near Cape Jashk, and in winter sometimes along the whole coast. In January or February, especially, a very strong shamal often blows home to Karachi, and along the coast southward to Bombay; there is generally only one such a shamal annually, and it lasts two or three days, raising a heavy sea. These winds are accompanied by a thick haze caused by fine dust, probably from the Mesopotamian plains.

In winter, heavy squalls from northwest to northeast, with rain are experienced off the western part of the Makran coast.

Remarks.—Off the Makran coast in April the absence of dew usually precedes a westerly wind, but it is also absent without any wind succeeding. A windy appearance of the sky frequently leads to nothing, and the strongest winds usually arise without any clouds or threatening signs. The boats easily rode out two bad shamals, and were never in difficulties. Any wind usually hauls two or three points to the northward during the evening and night. In moderate weather, the wind follows the sun with considerable regularity, a calm being almost invariable during the forenoon.

Cyclones.—The cyclones of the Arabian Sea seldom reach the Makran coast; their effect is, however, felt in a heavy southerly

swell with falling barometer, cloudy unsettled weather, and, after the storm has passed, a strong breeze or moderate gale from the southwestward. The effect of bad weather to the southward is always felt in a similar manner, although it does not reach the coast.

Climate—Persian Gulf.—The climate of the Persian Gulf is one of the most trying imaginable, though perhaps on the whole not unhealthy for Europeans. The intense heat of the summer is aggravated by the humidity of the atmosphere,[1] and by the dust raised by every wind; nor are there rains or clouds to temper the excessive heat.

The Arabian coast is hotter and less healthy than the Persian, and the heat is greater at the southern end of the gulf than at the head.

In winter, the winds are cold and cutting, but although the temperature is then more agreeable and apparently better suited to Europeans, experience shows it to be not the most healthy season.

The following is a general summary:

January and February.—Cold and boisterous. Gales prevail, with rain and bad weather. Frequently the bad weather begins about the beginning, but occasionally not until near the end of January. The lowest temperature of the year occurs in the first half of February.

March.—Generally fine and clear, with variable winds and pleasant temperature. The natives consider the bad weather over in the southern part of the gulf after the middle of the month. Intervals of variable winds and fine weather are frequent, though it is sometimes unsettled.

April.—Pleasant, getting hot toward the end. Generally fine, with moderate shamals occasionally. Sometimes an easterly gale, or strong shamals, or heavy squalls, in the northern part. Variable winds, however, prepail, sometimes with rain. There is seldom any bad weather after the middle of the month.

May.—Getting hot, but generally fine; moderate shamals frequent; heavy squalls have been experienced, but are exceptional.

June and July.—Until the middle of July the heat at the head of the gulf is moderated by the almost constant shamal, the air being generally laden with dust, but from that time the heat is most intense, and with a southerly wind, almost insupportable, from the increase of humidity.

August.—Heat most intense, the black bulb thermometer rising on shore to 159° F. in the sun. In the shade, on board ship, the range is small; at Abu Shahr, from 90° to 93° at 4 h. a. m. to 96° or 98° in the afternoon. At Basidu it is rather higher. In the Shatt al Arab the thermometer is stated by Loftus to have risen to 124° in the

[1] The packing of chronometer boxes requires frequent examination to see that it is free from damp and mildew; tarred oakum has been used for this purpose with good effect.

shade. The great heat at night renders the weather the more distressing.

September.—But little cooler than August; the nights, however, are less oppressive, particularly toward the end of the month. The heat is said to be necessary for the maturing of the date crop.

October.—Though still hot, the weather is more bearable; toward the end, the squalls, which usually occur, reduce the temperature considerably.

November.—Generally fine; atmosphere often very clear; temperature pleasant.

December.—Often fine, cool, and pleasant before the bad weather, which seldom begins until the middle of the month, or more frequently later.

Makran coast.—The climate of the Makran coast is intermediate between those of the Persian Gulf and India, and it differs considerably in the eastern and western portions. Although northward of the limits of the monsoons of the Arabian Sea, it is usual to speak of the southwest monsoon on this coast, because its effects are felt in many ways, thus: The heavy monsoon swell rolls up from June to September, when humid cloudy weather prevails with occasional westerly winds, and rain in the eastern districts; the reduction of the temperature in the eastern part, while in the western part, cut off from Arabia by its influence, the heat approaches that of the Persian Gulf. The weather, which as a whole, is singularly fine and safe for navigation, may be summarized as follows:

January.—Strong northeasters or land winds; also squally, northeast to southeast winds, with some rain; sea breezes (if any) light Sometimes a strong shamál; atmosphere dry; winds cold and cutting; clouds of dust accompany and at times precede the strong winds; weather fine, but sometimes gloomy and overcast.

February.—Land breezes moderate, with light sea breezes, or moderate shamáls; generally one strong shamál during the month. Sometimes squally with rain from the eastward, shifting to westward at Cape Jashk, otherwise fine dry weather.

March.—Land breezes failing; weather generally fine but getting humid; sea breezes light to moderate, southwest, veering to west-northwest or northwest at night; also strong, or a shamál, with much dust. Occasional calms chiefly in the forenoon; weather settled and fine.

April.—Very fine but hazy; air much warmer but very humid; sea breezes northwest to southwest, occasionally fresh, and, towards the end of the month, strong. Sea smooth, sometimes hot winds off the land.

May.—Calm in the morning, with strong sea breezes; hot, very humid, hazy, and with clouds passing rapidly to the eastward. Gen-

erally fine, and water smooth except the swell due to the sea breezes. Heavy squalls from west-northwest, with rain, have occurred. Near Cape Jashk, light breezes from southeast to southwest, with an occasional shamál.

June.—Similar to May, with probably a few days of light airs or hot scorching winds from the land, rendering the heat very oppressive, until about the middle or latter part of the month, when the monsoon, preceded by a falling barometer and threatening weather, usually sets in on the eastern part of the coast, as a strong west-southwesterly wind or moderate gale; this may last from a few days to a fortnight, and is preceded or accompanied by a heavy swell, out of proportion to the amount of wind. The weather then becomes cooler, the clouds and scud pass to the eastward, and the humidity continues. On the western part, light southeast and southerly winds prevail, varied by strong westerly breezes, with dust and a high temperature.

July.—The first burst of the southwest monsoon is often followed by less boisterous winds; when the monsoon does not set in until this month it is preceded by very hot unpleasant weather. Soon after the middle of the month there is an interval of light winds, after which the rain of this season occurs; it generally begins between the 15th of July and 10th of August with a squall, thunder, and lightning, from the northeast, followed by a strong westerly wind. Lightning in the evening to the northeastward at this season is a good indication of rain.

On the western part of the coast the heat is excessive in July, and so continues until the end of September; light southerly to southeasterly winds prevail, with an occasional fresh hot west-northwesterly wind.

August.—Much cooler; air clearer and drier after the rain; monsoon breeze and swell moderate or light, and the wind more westerly at night. Sometimes heavy weather and rain occur. Native craft go to sea again early in the month. On the western part of the coast the weather is the same as in July.

September.—The southwest monsoon generally ends about the beginning of this month; light winds, with a decreasing swell, but at times strong west-southwesterly winds, with a heavy swell, continue up to the middle or latter part. Light airs and calms are common. On the western part of the coast, the temperature continues very hot, with light variable winds and an occasional fresh shamál. In 1872 there was an easterly gale, with rain, lasting a few hours; this is exceptional.

October.—Fine, clear, and dry; light sea breezes and calms; land breezes generally very light, but occasionally fresh for a few hours. Sea smooth.

November.—As in October, but about the middle sometimes squally from the eastward, with unsettled weather and ground swell, probably due to bad weather to the southward.

December.—Fine, with moderate land and sea breezes. The land breezes are often strong towards the end of the month, when a moderate gale from northeast to southeast with rain is frequent. Shamáls occur at times on the western part of the coast. The weather is usually clear, but the land is sometimes obscured by dust. It is often exceptionally clear and very cold after rain. Sea generally smooth. In December and January, the bad weather of the Persian Gulf sometimes reaches Cape Jashk, or still farther eastward.

The sea.—The conditions during summer in the Persian Gulf are the more trying to those on board ship from the excessively high temperature of the sea, which has been known to reach 98°, and is seldom below 90° F.

Makran coast.—The temperature varies, being much hotter in in summer at the western end than near Karachi; in winter, it is more uniform. The eastern part is cooled by the strong westerly breezes in May, and there is a marked decline in the temperature after the rain has fallen. At Cape Jashk, the mean temperature varies from 67° in January to 91° in July.

There is much humidity between March and September, when the difference between the dry and wet bulb thermometers is very small, often nil.

The sea.—The temperature of the sea on the Makran coast varies from 71° in February to 84° in May.

Waterspouts at sea, and sandspouts on land, are frequent in the gulfs and along the Makran coast.

Rainfall.—The rainfall is small and variable; at Abu Shahr the mean annual fall is 11.8 inches; falls of from 5 inches to 29 inches annually are said to have been registered. At Maskat the mean fall is 4.2 inches; from 3 to 8 inches have been recorded, and on the 4th and 5th of June, 1890, during the cyclone mentioned on page 28, it rained continuously for 24 hours, during which time 11½ inches fell. With rare exceptions rain falls only in winter. On the shore of the southern bay of the Persian Gulf rain is said to fall very rarely.

On the Makran coast the rainfall is uncertain, but generally small; sometimes there is hardly any rainfall for two or three years, but every now and then a large fall occurs during the year; generally when that is so the rain falls in such heavy downpour as to be hardly less destructive to cultivation than the long droughts; the rivers or water-courses at such times discharge an immense volume of water.

From Karachi westward to Ormara rain falls generally in July or August, but little or none falls at this season on the western part of

the Makran coast. Rain also falls in winter along the whole coast, generally in December or January, and sometimes in February; this rainfall is more abundant on the western part of the coast than near Karachi. The average at Karachi, which is probably greater than on the coast, is 7.6 inches.

Dew.—The dew is very heavy in the Persian Gulf, especially in summer, when the sails appear in the morning as if drenched by a heavy shower of rain.

On the Makran coast dew is heavy from March to September, and occasionally during the winter.

Fog.—Dense fog, wetting everything like rain, occurs at times near the shores of the gulfs, and always in the morning; it only lasts a few hours.

Dense wet fog is sometimes experienced near the Makran coast and is most frequent in winter; it occurs in the morning with a land wind, and always clears before noon.

Barometer.—In the Persian Gulf in winter the average height of the barometer is about 30.10 inches, and the extreme range is about 0.8 inch.

In summer there is a remarkable annual depression of the barometer; it falls decidedly about the beginning of May, and during the three following months stands with but little variation from 29.50 to 29.60 inches, according to locality.

The diurnal variation of the barometer is somewhat peculiar; there is only one maximum, at 10 h. a. m., and one minimum 4 h. p. m., from which latter time it rises gradually until the next 10 h. a. m.; the depression which should occur at 4 h. a. m. being hardly perceptible. The diurnal variation is about one-tenth of an inch.

The barometer is not a safe guide and as a rule gives no warning of bad weather in the Persian Gulf, the worst weather sometimes occurring without any change at all, or the change does not take place until the gale has set in.

On the Makran coast the barometer is generally a good guide for the weather; its range, although small, is greater than in the Tropics, and it falls before bad weather. The shamal and occasional squalls, however, often occur without barometric warning.

The highest reading that has been observed is 30–40 inches in December, and the lowest 29–52 inches in June.

Currents—Persian Gulf.—The greater part of the current supposed to exist in the Persian Gulf is probably due to the tidal currents. Little is known about any current in the northern part of the gulf, but recent investigation shows that at times, especially in January, April, May, and June, there is considerable current in the southeastern part. Current setting from 10 to 20 miles a day in

January, and from 15 to 40 miles a day in April, have been experienced, and they must therefore be given consideration in navigation.

The currents appear mostly to set into the gulf, and then rather along the Persian coast, turning off somewhat toward the Arabian coast from about Jezirat Sheikh Shuaib; there appears, however, to be no general system.

During a shamal or kaus the usual current is affected by a slight surface drift current, but it is said that on the fourth day of a shamal a current sets at the rate of 1 knot against the wind. This, however, is doubtful.

Gulf of Oman, southwest shore.—During the southwest monsoon there is generally a northwesterly current, which has rates of from 10 to 35 miles a day along this shore. From October to February, when shamals prevail in the gulf, the current usually sets southeastward; between Maskat and Ras al Hadd it attains velocities of from 10 to 45 miles a day.

Makran coast.—Here the currents depend on the prevailing winds, and though variable in strength are least irregular during the southwest monsoon, when they generally set eastward along the coast at rates of from 10 to 30 miles a day. During the northeast monsoon and in the periods between the monsoons the current is quite uncertain, though it sometimes sets westward at rates of from 10 to 35 miles a day.

Tides.—In the Persian Gulf the tides are complicated, owing to the contracted and winding entrance with its many islands and shoals, and not much is known about them.

The diurnal inequalities of height and time are very marked; in winter the night tide and in summer the day tide is the superior, while the second tide in either case is quite insignificant. The rise is affected by the winds, as is the general level of the sea, to the extent of a foot or more, the shamal lowering the general level of the gulf and the kaus raising it.

The highest level of the water occurs about the August springs, which may be attributed to the heaping up of the water on the northern shore of the Arabian Sea by the southwest monsoon during June, July, and August.

The tidal wave takes about one hour traveling from Maskat to the entrance to the Persian Gulf, and thence about 13 hours to its head, passing Ras Rakkin and Ras al Mutaf, on opposite sides of the gulf, at about the same time. Its progress in the deep water of the Gulf of Oman is much faster than in the shoaler water of the Persian Gulf. The wave takes about 6 hours going from the bar of the Shatt al Arab to Basra. It is high water, full and change, at Maskat at 9 h. 32 m.; at Jashk Bay 9 h. 30 m.; at Ras Musandam about 10 h.;

at Basidu 0 h. 0 m.; at Jezirat Kais 0 h. 30 m.; at Bahrein 6 h. 5 m.; at Abu Shahr 7 h. 43 m.; and at the bar of the Shatt al Arab 11 h. 30 m. The rise at springs varies in places in the Persian Gulf from 6 to 13 feet, and in the Gulf of Oman and on the coast of Makran from about 5 to 10 feet.

Tidal currents—Gulf of Oman and Makran coast.—In the Gulf of Oman the general set of the current is to north-northwest from 4 hours before to 2 hours after high water at Maskat, with a velocity of ½ to 2 knots, and is strongest on the western side, as Ras Musandam is approached. From 4 hours after to 5 hours before high water the currents set south-southeast from 1 to 1¾ knots.

On the Makran coast, from Karachi to Gwater Bay, the current sets eastward during the rising, and westward during the falling, tide, but westward of Gwatar Bay it sets westward during the rising, and eastward during the falling, tide. The currents appear to turn at about high water, and 6 hours after high water, on the shore; they are generally weak, but are said to attain a velocity of from 1½ to 2 knots off Ras Maidani, and are much influenced by the southwest monsoon.

The currents appear to be weak off Cape Jashk, but strengthen toward Ras al Kuh, off which the current sets north-northwestward during the rising, and south-southeastward during the falling, tide, at a rate of from 1 to 1½ knots.

Persian Gulf and approach.—The times of the turn of the currents in the Persian Gulf and its entrance are very variable, and generally the set which will be experienced in any locality can not be foreseen and allowed for.

Northward of Ras al Kuh, the currents becomes very strong, and they attain their greatest velocity of about 4 knots, and probably more, at springs, at Ras Musandam, with eddies and races near that ras, and between it and Salama wa Binataha Islets. On the eastern shore of the entrance to the gulf, the velocity of the currents is less, and it is perhaps from 2 to 3 knots off Guru.

The north and west going current in the entrance has been reported to run from 5 to 2 hours before, until from 1 to 4 hours after, high water, and the east and southgoing currents from 1 to 4 hours after high water until from 5 to 2 hours before the next high water; the currents appear to be much influenced by the prevailing winds. Northward of Ras Musandam, the north-going current turns westward and southwestward, the northern portion passing on both sides of Larak, Hormuz, and Kishm islands, at a velocity of from 2 to 3 knots, and the southern portion setting southwestward along the coast of Oman, at a velocity of from 1 to 2 knots; the east and south going current sets in the reverse directions.

In the northern part of the gulf the currents turn much nearer the times of high water, and 6 hours after high water, than in the southern part.

In the rivers, the velocity of the currents is usually about 3 or 4 knots at springs, but when the snow melts in the mountains of Kurdistan, the outgoing current attains a velocity of 5 knots. The duration of the outgoing current is 8 hours, and that of the ingoing current 4 or 5 hours; the currents continue some time after high and low water.

Between Kisham Island and Ras Musandam, from low water to 1 hour before high water at Maskat, the current is slack, or has a slight set to the west-southwest. At high water it sets to the west-southwest, and continues in this direction until 5 hours after high water, with a velocity of ¾ knot to 2 knots.

Near Farur and Jezira Taub the current is slack, or sets to the eastward, when the tide is rising at Maskat; it then turns, and sets about west and west-northwest, past the islands, for 4 to 5 hours, continuing to run to the westward longest near Farur, the velocity being from ½ to 2 knots.

Off Linga the current sets southwest from 2 hours to 6 hours after high water at Maskat, and northeast from 5 hours before to 1 hour after high water, at a velocity of ¼ to ¾ knot.

Near Ras al Khaima the current sets to the northeast along the coast when the tide is rising at Maskat, and to the southwest when it is falling, with a velocity of ¼ to ½ knot.

In the passage northward of Henjam the tidal current sets to the northwestward from 2 hours before to 2 hours after high water at Maskat, and to the southeastward from 4 hours after to 4 hours before high water.

Waves.—The sea gets up quickly, and is short and hollow in the Persian Gulf. At the entrance, when the tidal current opposes strongly a heavy shamal, the sea is particularly distressing, breaking very heavily; it is often out of all proportion to the amount of wind, but quickly subsides after a gale. During a heavy shamal, there is a very high sea off Maskat, and also on the Makran coast.

Swell.—The swell of the southwest monsoon rolls around Ras al Hadd, and is felt off Maskat, and slightly, even near the entrance to the Persian Gulf. Sometimes there is a high swell in the entrance to the gulf for several hours, without any wind either preceding or following. Such a swell is generally, however, the forerunner of a gale.

From June to September, a heavy swell, caused by the southwest monsoon in the Arabian Sea, rolls in on the Makran coast. The swell comes from west-southwest or southwest at Karachi, from

south-southwest at Gwadar, about south at Chahbar, and southeast at Cape Jashk. It decreases gradually from Gwadar to Cape Jashk, where it is a low ground swell. The swell is usually much heavier than that due to the amount of wind on the coast, but it varies much, and during a break in the monsoon is often light; sometimes it disappears early in September, at other times it continues heavy during the greater part of that month, but quite ceases by the end.

On the occurrence of a cyclone or storm in the Arabian Sea, considerable swell rolls up from the southward, or there is a heavy ground swell with surf on the coast.

Pilots for the Persian Gulf are now seldom employed generally, especially as the men offering their services usually possess local knowledge only, and it should be borne in mind that pilots taken on board for the Arab coast are only to be depended on for certain localities.

For pilots for particular localities, such as the Shatt al Arab, see the places.

Communications—Roads.—There are no proper roads in the countries bordering the Persian Gulf and the Gulf of Oman, nor in Makran, and wheeled vehicles are almost unknown. Communication with the interior is entirely by camels, mules, and donkeys; the roads are merely tracks made by passing caravans; they often follow the beds of watercourses, and are hardly perceptible to a stranger.

In Oman the interior is in an unsettled condition, and traveling without a large escort is dangerous.

Steamships.—In normal times the British India Steam Navigation Co. provided a weekly fast mail service between Bombay and Basra, up and down the gulf, calling at Karachi, Maskat, Abu Shahr (Bushire), and Muhammera; and a weekly subsidiary mail service, calling at Karachi, Maskat, Bandar Abbas, Henjam, Linga, Bahrein, Abu Shahr (Bushire), Kuweit, and Muhammera weekly; and at Pasni, Gwadar, Chabar, Jaskh, and Dibai fortnightly, on the passage from Bombay; and at Muhammera, Abu Shahr (Bushire), Henjam, Bandar, Abbas, Maskat, and Karachi weekly; and at Kuweit, Bahrein, Dibai, Linga, Jashka, Chahbar, Gwadar, and Pasni fortnightly on the passage to Bombay. The fast mail service vessels stop for mails weekly at Fao.

An English company and the Turkish Government run frequent steamers between Basra and Baghdad, and steamers run on the Karun River to Ahwaz and Shustar.

Telegraph.—There are cables from Fao to Abu Shahr (Bushire), thence to Henjam, Kishm, and Bandar Abbas, and from Kishm to Jashk. There is also a direct cable from Abu Shahr to Jashk. From Jashk there are cables to Maskat and Karachi. Any vessel hooking a cable with her anchor, or otherwise damaging it, should

immediately communicate with the telegraph department, giving the details of the accident.

There is a land line of telegraph along the Makran coast, and messages are received at the stations Ormara, Gwadar, Chahbar, and Jashk. A light is shown at the telegraph stations when a vessel is expected, or an answering blue light burnt if signals are observed.

The cables and land line are connected with the universal telegraph systems.

Radio.—There is a radio station at Jashk. Radio stations are shown on H. O. Chart 2180.

Lloyd's signal stations are established at Cape Jashk, Jezirat Henjam, and Abu Shahr (Bushire), and are controlled by the Indo-European Telegraph Co. Vessels can communicate with these stations by the international code; no lookout, however, is kept, and vessels desiring to communicate must attract attention by means of a steam siren or otherwise.

Native craft.—Part of the trade between the Persian Gulf and India, the Red Sea, and the East coast of Africa, is carried on in native vessels called bagalas. They are from 100 to 400 tons, are clumsily rigged with a huge mainmast and lateen sail and small lateen mizen; they do not go to sea in the southwest monsoon. They sail well in moderate winds.

The smaller vessels used in the pearl fishery and for the coasting trade, of from 10 to 120 tons, are called batils and bakaras; they are rigged similarly to the bagalas.

Piracy on European vessels within the Persian Gulf or Gulf of Oman need not be apprehended. Piracies on native boats occasionally occur in the gulf and on the bar of and in the Shatt al Arabs British Indian sailing vessels which come from India for dates are particularly liable to attack during the date season. British naval vessels in the gulf are specially charged with the duty of preventing and repressing piracy generally, and one of them regularly patrols the pearl bank area during the pearling season. Southward of Ras al Hadd, a vessel grounding would certainly be plundered by the Bedawin.

Obtaining information.—It is most difficult to get trustworthy information from the Arabians, and but little that they impart can be relied upon.

Presents.—A vessel anchoring off an Arabian town is besieged for medical aid; strong aperients, opium, mercury, eye medicines, caustic for sores, and lint are the articles generally asked for. The most acceptable presents for any services rendered are rifles and cartridges, lead, cutlery, small telescopes, cloth, looking glasses, colored silk handkerchiefs, and watches.

Lights and buoys.—The Indian Government has established lights at Chahbar, Jashk, Little Quoin Islet, Jezirat Henjam, Jezirat Tanb, Abu Shahr (Bushire), and Kuweit; light buoys at Bahrein, off Kishm Town, Abu Shahr, and the outer bar of the Khur al Kalka, the channel into the Shatt al Arab; and buoys at Behrein and Kuweit. There are also lights at Linga and Fao, a buoy at Bandar Abbas, and buoys in the Khur al Kafka.

Beacons are rare and mostly insignificant.

Coal can usually be obtained at Abu Shahr, Basra, and Muhammera. See places.

Docks.—There are no docks, nor any accommodation for repairing ships, with the exception of a small mud dock for river steamers at Makil, where there is also some repairing plant for such vessels.

ROUTES.

Aden to Persian Gulf—Full-powered steamers.—Direct. Distance to Maskat 1,200 miles and to Basra 1,970 miles.

Steam vessels of small power.—From October to April steam along the Arabian coast. If the current is strong inshore, it may be less in strength from 60 to 80 miles off the land.

From May to September keep along but not close to the Arabian coast, as the weather is hazy; after rounding Ras al Hadd, stand over to the northern shore of the Gulf of Oman and keep along that shore, or, for Maskat, keep along the Arabian coast.

Persian Gulf to Aden—Full-powered steamers.—Direct.

Steamers of small power.—From October to May, proceed direct. From June to September, during the southwest monsoon, stand southeastward from Ras al Hadd, passing well westward of the Laccadive Islands, until in about latitude 7° north, where the wind is usually light and the sea smooth. Then steam westward until in about longitude 53° east, when steer north-northwestward. Give Sokotra and Abd al Kuri an ample berth, by not going northward of the parallel of 10° north latitude until on the meridian of 53° east longitude, as the current generally sets strongly toward these groups. Round Ras Asir closely.

Bombay to the Persian Gulf—Full-powered steamers.—Direct. Distance to Maskat 850 miles, to Basra 1,620 miles.

Steamers of small power.—In September and October and also in March and April, proceed direct, keeping along the north shore of the Gulf of Oman, or direct to Maskat.

From November to February, inclusive, proceed northwestward, passing not far from the Kathiawar coast, until in about 23° north latitude, whence proceed along the north shore of the Gulf of Oman, or direct to Maskat.

From ports of India to the southward, steam northward along the coast till westward of Bombay, and thence as above.

In May or early in June, steer westward in order to be able to proceed to the Gulf of Oman with the first of the southwest monsoon.

In June, July, and August, proceed to the southward, passing westward of the Laccadive Islands, until in about 9° north latitude; steer westward between the parallels of 7° and 9° north latitude until in about longitude 65° to 63° east, and thence direct to Ras al Hadd. Or, pass eastward of the Laccadive Islands, through the Nine Degree Channel, and thence as above.

Persian Gulf to Bombay—All steamers.—Direct.

Cape of Good Hope to the Persian Gulf—Steamers.—Along shore to Algoa Bay, through Mozambique Channel, and thence direct. Coal can be obtained at Zanzibar. Vessels of small power and unable to steam against the northeast monsoon (the usual force of which is about 4), pass near Mauritius, and northward along the west coast of India, when arriving in that monsoon.

A vessel from the east coast of Africa should pass not less than 90 miles eastward of Sokotra, in order to void the confused sea nearer that island.

Persian Gulf to Cape of Good Hope—Full-powered steamers.—Direct, through Mozambique Channel. In the strength of the southwest monsoon, it might be advisable to make southing from Ras al Hadd to about latitude 5° north, and thence proceed through the Mozambique channel.

Steamers of small power.—From October to May, proceed direct through the Mozambique Channel. From June to September, stand southeastward, and cross the Equator into the southeast trade; pass southward of Mauritius, and 100 miles southward of Madagascar, and make the African coast about 200 miles southward of Port Natal.

Persian Gulf.—Steamers in the Persian Gulf steer direct from point to point, but the following information may be useful.

When navigating up or down the gulf keep along the Persian coast, which is generally high, with salient features, mostly steepto, and with but few outlying shoals. Except at the entrance, the Arabian coast is very low, and generally reefs extend long distances off it.

The numerous islands and strong tidal streams near the entrance, and the frequency of bad weather, necessitate caution. Strong breezes and sudden shifts of wind set in with but little or no warning.

During shamals, especially in summer, and while the nashi is blowing in the southern part of the gulf in winter, the very hazy state of the atmosphere so completely obscures the land that the surf on the beach may be the first intimation of its proximity.

Passage up the Gulf.—When bound up the gulf, calling at Maskat, it is usual to make the Arabian coast, which in the fine season

is generally visible from a great distance, especially at sunset. The high land between Ras Abu Daud and Sur is first seen, and the Devil's Gap is noticeable.

During the southwest monsoon, pass some 3 miles off Ras al Hadd; the high land will probably not be visible until off Sur or Kalhat, and, owing to the haze, may not be seen at all if far off-shore, except that it often shows about sunset.

Maskat to the entrance.—From Maskat steer to pass a convenient distance from Ras al Kuh and the Salama wa Binataha. With a shamal, to avoid the lee current and heavier swell on the Arabian coast, it is best to stand well over toward the Persian coast.

The Persian coast is fairly steep-to and safe of approach eastward of Cape Jashk, but is low, and the hills a considerable distance inland; therefore it should be given a good berth at night. The coast continues low northward to Jezirat Hormuz, and the hills in the background render it difficult to judge the distance off-shore. The lead is but little guide.

The tidal currents on the Arabian coast northward of Jazirat Lima are very strong, especially northward of Jazirat Umm al Faiyarin, and the water is too deep for anchoring.

The entrance to Jezirat Tanb.—From Ras al Kuh to Jezirat Henjam the tidal currents become strong across the entrance. On passing the Salama wa Binataha, guard against the northgoing current.

The shamál blows here from west-southwest to southwest, and the lee shore must not be closely approached. There is sheltered anchorage northward of Jezirat Hormuz, or Kishm town.

The flat off the southwestern end of Kishm Island requires caution when approaching it; discolored water marks its edge, and fishing boats often anchor here.

Jezirat Tanb to Jezirat Kais.—Pass on either side of Coote Rock, Jezirat Tanb, and Jezirat Nabiyu Tanb. Thence pass near Jezirat Farur, which shows well at night unless the weather is hazy, and Jezirat Kais.

In shamáls there is less sea near the Persian coast than at a distance off it.

Jezirat Kais to Ras al Mutaf.—Pass southward of Jezair Hindarabi and Sheikh Shuaib, and then southwestward of Ras al Mutaf; the mudcolored water on the shoal, of which the ras is the southwestern extremity, extends some miles outside it, and is a good indication of its vicinity by day.

In thick weather, or at night, a depth of 15 fathoms leads about 10 miles southwestward of Ras Mutaf, but caution is necessary, for if set to the northeastward, the course would lead from depths of 30 to 40 fathoms, through 15 fathoms, directly on to the shoal.

From Jezirat Kais to Ras al Mutaf, the smoothest water is inside the islands, and this route can be taken in daylight.

The channel between Jezirat Sheikh Shuaib and the mainland, where there is anchoring ground, is clear, but neither the sandy shoal off the low eastern point, nor the western end of the island, should be approached closely.

Shelter from shamáls can be obtained in Çhiru Bay, off the eastern end of Jezirat Sheikh Shuaib, off Shiwu, and under Ras al Mutaf Shoal.

The lead is no guide in passing Jezair Kais, Hindarabi and Sheikh Shuaib, deep water being close to them.

Ras al Mutaf to Abu Shahr (Bushire).—From about 10 miles southwestward of Mukhaila, an islet 11 miles northwestward of Ras al Mutaf, steer to pass about 6 miles outside Abu Shahr peninsula. This track leads along, and from 6 to 10 miles off the coast, in general depths of from 12 to 22 fathoms. The coast near Ras al Khan, 15 miles north-northwestward of Mukhaila, is very low, but the mountains, about 4 miles inland, extending some 40 miles northward from about 9 miles northward of Ras al Khan, are conspicuous.

If bound for Abu Shahr harbor, make Rishahr Point, off which the 10-fathom curve is 4 miles distant. Then cautiously stand in to 6 fathoms, and run along shore in that depth until the lightbuoy at the outer anchorage is sighted.

At night keep in 10 fathoms water, and make Abu Shahr lights.

Abu Shahr (Bushire) to Shatt al Arab.—From off Abu Shahr, steer direct to the lightvessel and thence to the outer lightbuoy off the Shatt al Arab, which, if in position, can be easily made out in moderate weather; but, if the weather be thick and the ship's position uncertain, endeavor to strike soundings on the Maidan Ali, and steer westward in 5 fathoms until the buoy is sighted. Take a departure from Kharag.

Shatt al Arab down the gulf.—If when off the bar a kaus (southeaster) suddenly sets in, and it should be necessary to anchor, the Maidan Ali appears to afford the best anchorage, as it is said that on this bank the force of the sea is less than in the channels or farther seaward.

Naband Bay affords shelter from a kaus, but, if followed by a shamál, a heavy sea would set in. Nakhilu Bay is the best anchorage in a kaus.

During a shamál, the extreme haziness of the air renders the greatest caution necessary in making or passing any of the islands, the lead being no guide. Jezirat Farur is the easiest to see, it being dark colored, high, and steep-to, except a small ledge on its western side.

Shelter can be obtained during a kaus either in Charak or Mughu Bays, but it is necessary to anchor well in, where there is shelter in a shamál, or everything must be ready to weigh and quit. Between Linga and the Basidu Flat there is not much sea in easterly winds. There is good anchorage northwestward of Jezirat Hormuz in a kaus.

Salama wa Binataha to Maskat.—Steer to pass a moderate distance off Ras al Kuh, avoiding the Batina coast, as it is a lee shore in a nashi, and in summer a northwesterly current often sets along it. From off Ras al Kuh steer direct to Maskat; or, in the summer, steer eastward of the direct course, until northward of that place.

In the southwest monsoon, the wind at Ras al Hadd is often from south or south-southeast, with a heavy sea.

CHAPTER II.

GULF OF OMAN—ARABIAN COAST.

RAS AL HADD TO RAS ASH SHATEIF, INCLUDING MASKAT.

(Lat. 22° 32′, Long. 59° 48′, to Lat. 23° 38′, Long. 58° 34′.)

Ras al Hadd.—Ras al Junaiz, the easternmost point of Arabia, is a low cliff which continues about 4 miles north-northwestward, and thence the coast is low and sandy to Ras al Hadd, 3 miles farther in the same direction. Ras al Hadd (Lat. 22° 32′, Long. 59° 48′), the southeastern extremity of the southwestern shore of the Gulf of Oman, is low, sandy, and not easily distinguished; the little town of Al Hadd, chiefly mat huts, with a few date trees, three round towers, and a population of about 700 of the Bani Ghazal tribe, lies 1 mile southwestward of it. A fourth round tower stands detached on Ras Dhaletya on the shore of Khur al Hajar. The people are civil, as are the inhabitants of all towns northward of this, and subject to the Sultan of Maskat.

Supplies.—A few goats, fish in abundance, and small quantities of fairly good water can be obtained here.

Anchorage.—There is open anchorage in from 8 to 10 fathoms water, coral, with Al Hadd town bearing 270°, from ½ mile to ¾ mile offshore; the water shoals rapidly from 10 to 5 fathoms; it is very clear and the bottom is visible. In the southwest monsoon there is better anchorage between the entrances to Khur al Hajar and Khur Jarama. When anchored anywhere between Ras al Hadd and Sur be prepared for a sudden shift of wind to the northward.

Temperature.—The temperature at Ras al Hadd anchorage, varying between 83° by day and 74° at night, in September, is much less than that at Maskat. The air is also drier than southward of Ras al Hadd, as it loses some of its moisture in passing over the land.

Tides.—It is high water, full and change, at Ras al Hadd, at 9 h. 30 m.; springs rise 9 feet.

Currents.—The currents off Ras al Hadd are strong, variable, and much influenced by the prevailing winds. From April to August, inclusive, the current usually sets northward on the Arabian

coast, southward of Ras al Hadd, and northwestward along the south shore of the Gulf of Oman, at rates of from 10 to 45 miles a day. In September, the current continues to set northward from 10 to 45 miles a day on the coast southward of Ras al Hadd, but it is variable on the south shore of the Gulf of Oman. In October the current is variable on the south shore of the Gulf of Oman, but generally sets southeastward from 10 to 20 miles a day, and it sets southward on the coast southward of Ras al Hadd. In November and December it sets southeastward on the south shore of the Gulf of Oman from the vicinity of the Diamaniyat islands to Ras al Hadd from 10 to 45 miles a day, and southward to southwestward off the coast southward of Ras al Hadd from 10 to 30 miles a day. In January it sets southeastward 15 to 30 miles a day on the south shore of the Gulf of Oman, but in February and March it is variable.

Sometimes, generally towards the end of the southwest monsoon, while the current sets northward on the coast southward of Ras al Hadd, it sets southeastward on the coast from Ras Abu Daud (Lat. 23° 19′, Long. 58° 56′) to Ras al Hadd, off which the two currents appear to combine and turn northeastward at a rate of about 2 miles an hour, increased by the east-going tidal current.

Owing to this current, vessels lying to at night off Ras al Hadd have been out of sight of land at daylight.

Soundings.—A bank with depths less than 100 fathoms extends about 2 to 4 miles eastward of the coast between Ras al Junaiz and Ras al Hadd, and here the 20-fathom curve is about 1 mile offshore. This bank is famous for large fish. Deep water approaches the northern side of Ras al Hadd to about ½-mile. There is no known offlying shoal on the coast between Ras al Hadd and Ras ash Shajar, 40 miles northwestward.

The bank extends about 3 miles off the coast westward of Ras al Hadd, but it closes the shore to about 1 mile at Sur, and thence to Karyat as Saghira its width varies from 3 to less than a mile.

In 1885, H. M. S. *Ranger* reported a sounding of 55 fathoms, sand and rock, approximately 18 miles, 125°, from Ras al Hadd, but the same vessel was unsuccessful when searching for this bank on a subsequent occasion, no bottom being obtainable at 80 fathoms.

The coast from Ras al Hadd trends westward about 2 miles to Ras al Haiya, and is low.

Khur al Hajar (lat. 22° 32′, long. 59° 46′) is a small inlet used by fishing boats; its entrance between two low cliffs, Ras al Haiya on the east and Ras al Hamma on the west, being 350 yards wide. There are from 5 to 3½ fathoms in the entrance, but the inlet soon shallows to 1½ fathoms, and its inner and largest part dries. The entrance trends half a mile south-southeastward, and the inlet extends 1 mile eastward, reaching close to the westward of the town

of Al Hadd. There is anchorage for a small vessel near the entrance, in from 4 to 5 fathoms, but it affords no shelter from the northward.

Tides.—It is high water, full and change, at Khur al Hajar at 9 h. 30 m.; springs rise 10 feet. At the anchorage near the entrance the tidal current sets weakly westward during the flood tide; the current sets eastward, with a greatest velocity of about 1½ knots, during the ebb tide. The times of the turn of the currents before and after high water are not known.

The coast from Ras al Hamma trends westward about 1 mile to Ras Bu Buraij, and is low cliffs.

Anchorages.—In the southwest monsoon there is good anchorage between the entrances to Khur al Hajar and Khur Jarama, in 12 fathoms, about ¼ mile offshore, and also off the entrance to Khur Jarama, about ½ mile from the shore, in 10 to 12 fathoms, mud and sand, with the low western point apparently half-way across the entrance channel, and Ras al Hadd tower bearing 112°; but they are not safe in the northeast monsoon. These are cooler and more pleasant anchorages than Maskat in the hot season.

Beacon.—A white conical stone beacon, 10 feet high, stands on Ras Bu Buraij.

Khur Jarama (Jaramah).—The entrance to this inlet, westward of Ras Bu Buraij, is a mile long, 150 yards wide between cliffs, 60 feet high, and tortuous; rocks have fallen from the cliff just southward of Ras Bu Buraij, and are covered at high water. The inlet is 2¼ miles long northwest and southeast, with an average width of 1 mile.

Depths.—Between the entrance points there are from 4 to 6 fathoms, mud, but ¼ mile farther in, shoal ground, with 1¼ fathoms water, extends from the western shore, leaving on the eastern side a channel 60 yards wide from cliff to shoal, with a least depth of 3½ fathoms. Within this shoal the depths are from 4 to 9 fathoms, passing eastward of the island at the inner end of the entrance channel, and there is an anchorage about 1 mile long northeast and southwest, and 400 yards broad, southward of the island, with from 3 to 4½ fathoms water, inside which the whole of the inlet shoals to from 2½ to 1½ fathoms, and less toward the head. In the channel westward of the island there is a depth of 2 fathoms.

The southern and southwestern shores are low, with a mangrove swamp, and an isolated black flat-topped hill, which is a good mark. Though the turnings in the entrance to this harbor are somewhat sharp, it is accessible to steamers of less than 15 feet draft, and affords excellent shelter.

Khur Jarama—Directions.—On account of the tidal eddies in the bends it is advisable to enter at high water. The anchorage, in 4 fathoms, inside the island is good, and well sheltered.

Supplies.—A few sheep, bullocks, and fowls are obtainable.

Tides.—It is high water, full and change, at Khur Jarama at 9 h. 30 m.; springs rise 10 feet. The rate of the tidal current through the entrance channel is about 2 knots.

Directions.—The small black flat-topped hill on the southwestern shore of the harbor, bearing 176°, leads to the entrance, which may be identified by the beacon on Ras Bu Buraij (lat. 22° 33′, long. 59° 44′).

When entering give a sufficient berth to Ras Bu Buraij to avoid the rocks fallen from the cliff, and then keep close to the eastern shore until past the shoal ¼ mile within the entrance, remembering that the channel here is only 60 yards wide from cliff to shoal. Then keep in midchannel, pass northeastward of the island dividing the passage, and anchor inside it. Flaws of wind are prevalent.

Khur Jarama is only used by native vessels as a harbor of refuge, as there is no village on its shores, and water is not procurable. There is an abundance of fish in the harbor, and beaches on which the seine may be hauled.

Ras Sherh (Sharh).—The coast from Khur Jarama to Ras Sherh, a slightly projecting point 5 miles to the westward, is cliffs; from Ras Sherh to Sur, 6 miles further westward, it is a ridge of low broken hills with patches of cliff.

Sur (Súr) is two towns, together containing a population of about 10,000, and standing on both sides of a khur, in which small craft lie. Fort Seneisala (Sanaisalah), a large square structure with towers, near the coast, about 2 miles northwestward of the khur, is visible from a distance of about 10 miles. This fort, and another standing higher, about 1½ miles west-southwestward, are surrounded by villages of considerable size. Jebel Khamis (Khamis), about 8 miles inland, and 2,700 feet high, bearing 212°, leads to the place. Just eastward of Sur, the bank of soundings is only 1 mile wide.

Umm Kareimatein (Mukraimatain), the larger town, is on the western side of the khur, and inhabitated by the Bani Jannabah tribe; in it is the residence of the Shaikh. Heija (Aika), the smaller town, is on the eastern side, and inhabited by the Bani Bu Ali; the two tribes are often at feud with each other. There is a fort, not visible from seaward, called Al Heis; it is chiefly for the protection of the wells, and has a garrison of the Sultan of Maskat's soldiers; here there is also a customs station. The country inland is partly cultivated, and there are many date groves. There is also said to be a town about 2 miles inland southward of the khur, where there is a good bazaar.

The khur is extensive, with a bar having 3 feet water at the entrance; within the bar there is a narrow channel about 800 yards

long north and south, with 1½ to 2 fathoms water; the khur appears to be shoal. The Shaikh levies a tax of $4 on every dhow passing over the bar, and a tax also on each passenger. But little of the town of Sur is visible from seaward.

Anchorage.—There is open anchorage off the town in from 8 to 11 fathoms, sand bottom, with the eastern entrance point of the khur bearing about 178° 1,200 yards. The water at the anchorage is very clear, and the bottom is visible in 10 fathoms. There is said to be shoal water of less than 3 fathoms off Fort Seneisala, and from 1½ to 2 miles west-northwestward of Sur anchorage.

Tides.—It is high water, full and change, at Sur at 9 h. 30 m.; springs rise 6½ feet.

Trade.—A large trade is carried on between Sur and India, Zanzibar, and the Persian Gulf, in bagalas; it possesses also numerous fishing boats, which frequent the coast of Arabia. The exports are dried dates and salt fish, and the people manufacture a coarse cloth for turbans, etc. Many natives of Kutch (Banyans) are settled here, and the trade is very much in their hands. The Sur people are enterprising and are bold sailors.

Supplies.—Cattle and vegetables might be obtained here, but any supply of water is doubtful.

The coast from Sur trends northwestward 29 miles to Ras ash Shajar (lat. 22° 56′, long. 59° 13′), and is generally low cliffs; after the first 3 miles it rises to the precipitous Jebel Beni Jabir, of which Jebel Kalhat is the southeastern end. These mountains are of regular outline, and average 4,500 feet in height; an inland range is higher, probably over 6,000 feet. Northwestward of Ras ash Shajar they recede from the coast and end at the Devils Gap.

Kalhat, 11 miles northwestward of Sur, is a small village. Kalhat may easily be mistaken for Taiwa, as they are both at entrances to gorges. A peak of the shore range about 1 mile southeastward of Kalhat will, however, usually indicate its position. There is said to be anchorage for small craft quite close in sheltered from northerly winds by a small projecting point. A vessel of any size would have to anchor close to the shore in very deep water. There is good water in wells, and bullocks, sheep, poultry, and vegetables are procurable in small quantities at this and the following villages.

At Haiwa (lat. 22° 46′, long. 59° 18′), 6½ miles northwestward of Kalhat, there is anchorage, but no inhabitants. Limestone of fine quality is shipped at this place for India.

Taiwa (Tiwi), 3½ miles northwestward of Haiwa, is a large village, with a male population of about 300, a date grove in a gorge, and a lagoon of fresh water, 400 yards from the sea. There are many fruit trees, and a few sheep and goats are procurable. No bottom was obtained at 100 fathoms off the village and ¼ mile from

the shore. A naval vessel anchored here in 9 fathoms close to the beach and northward of a small spit.

Shahab (Shab), 1½ miles northwestward of Taiwa, is a small village with a tower on a little hill at the entrance to a deep gorge (Wadi Shab) in the mountains. A fine stream of excellent water issues from the valley and forms a lagoon within 50 yards of the sea, which is convenient for vessels watering. Anchorage can be obtained in from 20 to 30 fathoms, between 600 and 800 yards offshore, but it should be quitted on the approach of a shamal.

Makalla wabâr, between Shahab and Ras ash Shajar, is an anchorage where small craft obtain shelter from a shamal. Fins and Daghmar, nearer the ras, are small villages, each having an adult male population of about 200; like the other villages at the foot of these hills they have good water, fruit trees, etc.

Ras ash Shajar, 6½ miles north-northwestward of Shahab, is low, sandy, and well defined only when close-to, but a single conspicuous tree standing ½ mile southward of the ras might indicate its position. About 3½ miles southward of Ras ash Shajar the mountains recede from the coast, which is low until about 3½ miles northwestward of the ras, where the mountains again approach the beach.

Anchorage has been obtained in 5¾ fathoms, rock and sand, about 800 yards from the shore, with Fins tower bearing 175° and Ras ash Shajar 308°. During a shamal native boats anchor very close-in southeastward of the ras.

The coast from Ras ash Shajar trends northwestward 28 miles to Ras Abu Daud; it is low cliffs until close to Karyat as Saghira, when it becomes low and sandy, but it is rocky for 2 miles southward of Ras Abu Daud.

A shoal extends about 1 mile off the coast for 5 miles northwestward of Ras ash Shajar.

Mountains—Devil's Gap (Wadi Hail al Ghaf).—Jebel Beni (Bani) Jabir recedes from the coast and terminates abruptly in a great bluff, on the southern side of the Devil's Gap (lat. 23° 5′, long. 58° 47′), 23 miles west-northwestward of Ras ash Shajar, and 12 miles inland. Northward of this gap, and about 12 miles inland, is a range of mountains, 6,300 feet high, extending northwest and southeast about 12 miles, of even outline on the summit, with Jebel Karyat, a small peak, and ending both northward and southward in bluffs, that at the southern end of the range being very grand and falling in steps. The Devil's Gap is the great valley between these ranges; it trends southwestward, and when bearing about 250° is quite open, and very remarkable; but it is conspicuous when bearing about 216° and 285°. Sometimes when the mountain tops on both sides are covered with a streak of dark clouds, the sky is seen clear

through underneath, which, in the evening, has a singular appearance. Very heavy squalls sometimes blow out of this valley in winter.

Jebel Abu Daud (Dawud), 4,000 feet high, is a detached mountain of irregular outline, deeply furrowed, and of light color, rising abruptly immediately westward of Ras Abu Daud. From a distance, when bearing about 312° it makes like an island, with a long slope on the inshore and steep to seaward, there being a wide valley between it and the back range. It extends 8 miles along the coast.

These mountains are the first land made on this coast, unless in hazy weather; when the sun is about setting their outline is often visible for a short time, perhaps only a few minutes.

From Abu Daud to Maskat there are numerous hills near the sea, with ranges of mountains stretching inland.

Karyat (Kuryat), two small mat hut villages, lie about 6 miles apart, with a large date grove between them, on a sandy plain, intersected by watercourses, which, in rains, discharge the waters from the Devil's Gap.

Karyat as Saghira (Saghirah) (the small) lies 8½ miles southeastward of Ras Abu Daud, at the southern end of the date grove, and 1½ miles southward of a projecting low sandy point. A white fort on a small mound above the trees indicates the position of the village, and there is a low range of hills about 4 miles inland.

Karyat al Kabira (Kabirah) (the large) is 3 miles southward of Ras Abu Daud; it is on the sandy foreshore, close to the hills, and backed by date groves. A small creek, just southward of the village, contained several dhows in 1909; the bar is awash at low water; a rocky islet, about 50 feet high, lies close off it. A watercourse also runs round the northern end of the grove, forming a small creek. A white square building stands a short distance southward of the village, but is almost hidden by date groves; a similar building, which is conspicuous, is situated in the village.

These villages contain about 1,000 men of the Bani Sinan tribe. The Bani Jabir are the principal tribe between Karyat and Kalhat; northwestward of Karyat are the Bani Battash.

Anchorage.—There is anchorage off Karyat al Kabira in 12 fathoms, sand, with the rocky islet 227°, and Ras Abu Daud 337°, about 1¼ miles from the shore, or, for steamers between Karyat al Kabira and Ras Abu Daud, in from 4½ to 5 fathoms, ¼ mile off-shore.

Supplies.—Cattle, fowls, fruit, vegetables, and water can be obtained here at a cheaper rate than at Maskat.

Soundings.—The bank of soundings extends about 1 to 3 miles off Karyat as Saghira (lat. 23° 12′, long. 58° 59′) and Ras Abu Daud; then to Ras al Khairan, probably 7 or 8 miles, decreasing again to 2 and 3 miles from that point to Maskat.

The 20-fathom curve is nowhere more than 1½ miles from the shore, while at Ras Abu Daud, Khairan, and Maskat it is close to the cliffs.

Shoal.—A bank of foul ground extends about ½ mile off the coast for about 3 miles northwestward of the low point northward of Karyat at Saghira; it has not been sounded.

Ras Abu Daud is steep and rocky, and a rocky islet, about 100 feet high, lies 300 yards to the northward, the channel between having a depth of 3 fathoms. The ras is not easily made out unless close in, as it is broken up into several points. Small vessels could obtain shelter during a shamal in the little bay just southward of the ras, but a sailing vessel could not get out if a kaus came on.

The coast for about 4 miles northwestward of Ras Abu Daud is cliffs, Jebel Abu Daud rising abruptly from them; then it becomes low and sandy as far as Sifa, 6½ miles farther northwestward, the mountains turning inland and leaving a plain between them and the coast.

Sifa is a square tower near the coast, on a mound about 60 feet high, with a date grove close to it. A range of rugged precipitous hills extends from Sifa to Ras al Hamar, about 6 miles west-northwestward of Maskat, the coast being almost entirely cliffs, with little sandy bays at intervals, and numerous inlets or coves.

Ras al Khairan (Lat. 23° 32′, Long. 58° 46′), 5 miles north-northwestward of Sifa, is a vertical cliff about 60 feet high, of a light color, as are also the hills within it. There are four little sandy bays southward of this point, of which the one close to it is about ½ a mile deep, with 3 fathoms water, but open to the northeast; Ras Kizkizan is the rocky peninsula on its eastern side. The next bay is insignificant; in the third, called Sifat ash Sheikh (Shaikh), is a grove of date trees; the last is Khaisat as Sum.

Bandar Khairan.—Immediately westward of Ras al Khairan are two islands, not easily distinguished owing to the similarity of their appearance to the mainland. On the southern side of the western island is Bandar Khairan.

The eastern island is ½ mile long, east and west, with a small rocky detached islet on its northeastern side; the channel inside it, in which is a rock above water, is 60 yards wide, tortuous, and shallow.

The western island is 1,800 yards long, east and west, 800 yards broad, 300 feet high, steep, and rocky; close to its eastern end is a small detached rock above water, between which and the eastern island is the eastern entrance channel, which is 600 yards wide, with 15 fathoms in the outer part. The anchorage in the passage between the island and a projecting point of the coast to the southward is from 70 to 200 yards wide, with depths of from 3¼ to 5 fathoms; off the southwestern part of the island it is wider, but there is a rocky

islet in the middle, with 6 fathoms on its northern side, and from 3 to 4 fathoms around. Southward of this islet is a narrow passage leading into a shallow bay extending 1 mile southward, and ending in a swamp; on its shores is a large grove of date trees and a small village.

The western entrance is 600 yards long, north and south, about 150 yards wide, and has depths of from 9 to 6 fathoms. This harbor is only frequented by fishing boats; the winds are generally baffling, especially in the western entrance, and blow in violent gusts during shamals.

Tides.—It is high water, full and change, at Bandar Khairan at 9 h. 0 m.; springs rise 5 feet.

The coast from Khairan trends westward 4½ miles to Yiti, and is rocky cliff.

Yiti is a small sandy bay with a little fishing village and a few date trees in the valley.

The coast from Yiti to Bandar Jissa, 2 miles northwestward, is rocky.

Bandar Jissa (Jissah) is a bay protected by a precipitous light-colored island, 600 yards long, east and west, 200 yards broad, and 140 feet high, in its mouth. The bay is about 1,600 yards wide, and recedes the same distance, with entrances at each end of the island; it has an indented outline, and there is an islet in its southwestern part. The eastern entrance is 300 yards wide, with a depth of 7 fathoms; the western entrance is nearly blocked by a flat rock or islet which has 1½ fathoms on each side.

Anchorage can be obtained in from 4 to 7 fathoms.

Tides.—It is high water, full and change, at Bandar Jissa at 9 h. 0. m.; springs rise 5 feet.

Village.—Westward of the islet in the bay is a large village with a population of about 500, and a date grove.

Supplies.—Poultry and eggs can be purchased at Bandar Jissa village, and good water obtained from wells about ½ mile distant from it.

The coast from Bandar Jissa trends northwestward 4½ miles to Maskat, and is a succession of rocky points and sandy bays, with several villages. Saddle Hill, 3½ miles west-northwestward of Bandar Jissa, and 1½ miles inland, is 1,340 feet high; it forms two sharp peaks the summits of a very rugged dark range, which in line bear about 250° true. It is not very noticeable from the northward, as the peaks then appear some distance apart. Al Bustan, the southernmost of the villages, has a data grove, and the inhabitants are agricultural. Kantab lies under Saddle Hill; it is a small fishing village not shown on the chart, and has near it, in the sandy bay, a pyramidal rock close to the shore.

Sudab (Sidab), a fishing village on the north shore of Bandar Sudab, a cove, 3½ miles northwestward of Bandar Jissa, which might afford shelter to small craft in a shamal, is separated from Maskat by a short ridge; there is a footpath between with a wall and gate in the pass. The coast on both sides of Sudab is cliffs, rising to rugged hills.

Ras al Kanada (Lat. 23° 37′, Long. 58° 37′), 1,200 yards northeastward of Sudab, is a cliff about 250 feet high; a detached pillar rock, about 100 feet high, lies 400 yards northward of the ras. Two small rocks, 4 to 6 feet high, lie within 200 yards from the shore about 800 yards northward of Ras al Kanada.

Moghab Bay (Mughab), about ½ mile northwestward of the detached pillar rock and close southward of Jalali Fort, is small, but affords good landing for boats, and there is sheltered anchorage for vessels of any size during a shamal off the bay and southward of Maskat Island. But the telegraph cable from Jashk is landed in the bay, and knowledge of its position and caution are necessary before anchoring, to avoid fouling it.

Maskat Island (Al Jazira), 1,200 yards northward of Ras al Kanada, is 1,400 yards long, north-northwest and south-southeast, 300 yards broad, 350 feet high, and its coasts are very irregular, rocky, and precipitous. A pillar rock, 100 feet high, lies close off its southeastern point. There is deep water close to the east coast, and depths of 30 fathoms from 200 to 400 yards off it.

Ras Maskat (lat. 23° 38′, long. 58° 36′), the northern point of the island, is a round sloping bluff, with cliffs to the southwestward. A reef extends about 60 yards northward of the ras, and about 50 yards farther northward, with depths of from 2 to 3 fathoms in the channel between, is Fisher's rock, 20 yards in extent and 10 feet high. There is a depth of 10 fathoms close northward of the rock.

Sira (Castle), on a small point 300 yards southwestward of Ras Maskat, is a fort or battery near the sea, with a tower halfway up the hill.

Maskat Cove, the eastern of five coves lying between Maskat island and Ras ash Shateif, 1¾ miles west-northwestward, extends southeastward about ¾ mile, with a least width of about ¼ mile, and has depths of from 9 to 13 fathoms in the entrance, shoaling gradually to 6 fathoms eastward of Sira al Gharbi (Sirat al Gharbiyah), and thence to 2 fathoms about 200 yards from the white sandy beach at the head of the cove.

Pinnacle Rock, close to Maskat Island, rather over 200 yards south-southeastward of Sira, is above water and white-topped. A rocky patch, with depths of from 3 to 2¼ fathoms, extends 25 yards west-northwestward from about 50 yards west-northwestward of

Pinnacle Rock, the least water being on its outer end. This rock, which is visible from the surface, prevents a vessel's stern being secured to Pinnacle Rock, unless anchored with Pinnacle Rock, bearing eastward of 109°.

The western shore of Maskat Cove rises to a detached precipitous ridge 435 feet high, the northern extremity of which is Ras Kalbu; there is a prominent white tower near the ras. About 700 yards southeastward from Ras Kalbu, a spur of the main ridge extends about 200 yards eastward into the cove, and on its outer end is the Sira al Gharbi (West Castle) (lat. 23° 38′, long. 58° 36′), a fort with two tiers of embrasures, and a round tower on its highest part. Makalla (Makallah) Bay, on the southern side of this spur, has depths of 3 fathoms and less; the smaller native vessels anchor here, and on the shore at its head are coal sheds. The ridge slopes down at its southern end to a cliff about 150 feet high crowned by the large fort of Merani (Mirani), with a battery near the sea level.

This fort, built by the Portuguese in 1588, is at the head of the cove, and close-to, on its southern side, is the landing place; boats can be conveniently hauled up and repaired here.

The front of the town extends about 400 yards along the beach at the head of the cove eastward of Fort Merani, and between it and Maskat Island are two small detached hills; the southwestern, about 150 feet high, is joined to the town by a low sandy isthmus, and has on it the large Jalali fort, also built by the Portuguese, with two tiers of casemated embrasures. This and Merani are the two principal forts, and command the town. The northeastern hill, about 100 feet high, becomes an islet at high water; the narrow Duweira (Duwairah) passage, separating it from Maskat Island, is available for small boats, though it is reported to be nearly dry at low water.

Mooring buoys.—Two small mooring buoys for boats lie 200 yards eastward of the northern extremity of Fort Merani, and a white mooring buoy, for the Sultan's yacht, lies 200 yards northward of the fort.

Pier.—A pier extends 300 feet eastward from the shore in the vicinity of the coal sheds in Makalla Bay, and has 4 feet water at its outer end. It is used for loading and unloading coal lighters, but is not available for landing as there is no way round into Maskat.

Wreck.—The wreck of a small sailing vessel lies in 3 fathoms water, 196°, 150 yards from the southeastern extremity of Sira al Gharbi.

Range lights.—Fixed white, established for entering Maskat Cove.

The front light is shown from the British consulate flagstaff, at an elevation of 62 feet.

The rear light is situated at a distance of about 450 yards 157° from the front light at an elevation of 165 feet.

They are unreliable. Fishers Rock well open of the northwest extremity of Maskat Island, or Pillar Rock well open of the southwestern extremity of that island, leads westward of Pinnacle Rock.

A flashing white light every 5 seconds is established on the eastern side of Maskat Island on the point 534 yards 132° from Fishers Rock.

Anchorage.—Anchor off the western shore, near Sira al Gharbi Point; native vessels anchor closer in.

A good berth for a large vessel is about 300 yards westward of Pinnacle Rock, with a hawser to that rock and her stern hauled toward it; in this position a vessel will lie broadside on to the breeze.

In the hot season small vessels anchor about 300 yards northwestward of Duweira Passage, and cant the stern toward the island by a hawser made fast to a chain secured around a rock for this purpose, which should be eased up during northerly winds. This is a cool berth.

Maskat Cove is open to shamals, which, however, as a rule, blow from some 20° off the western shore, while the sea sets straight in; a vessel making a stay should therefore always use a stern anchor to keep her head on to the swell. Nashis also send in a heavy sea, and there is little or no shelter from them. The bottom is sand and shells, but, with a long scope of cable, vessels seldom drag, and near the rocks there appears to be a rebound of the sea, which lessens the strain. Outside the cove, in depths over 20 fathoms, the bottom is clay or mud.

A good line for approaching the anchorage westward of Pinnacle Rock is with the British consulate flagstaff in range with the eastern end of the wall eastward of Buma Sali tower bearing 158°.

Within the 5-fathom curve is generally unavailable as anchorage, as the space is usually occupied by dhows and the Sultan's yacht.

There is good anchorage, even during a heavy shamal, at 400 yards eastward of the coaling pier, over a sandy bottom.

Tides.—It is high water, full and change, in Maskat Cove at 9 h. 32 m.; springs rise 9 feet, neaps 6 feet.

Directions.—Approaching Maskat either from the eastward or westward, Saddle Hill is remarkable. In the background are the Karyat Range, and, to the westward, Jebel Tain and Jebel Kakhl, with lower ranges between them and the coast. These are visible in clear weather.

Maskat (lat. 23° 37′, long. 58° 36′) has often been passed as the towns do not show up well under the dark hills, and are only visible when the coves are open.

In the morning, Jalali Fort, on westerly bearings, with the sun shining on it, sometimes shows white against the dark hills behind.

From the westward, Fahal Island is a good mark.

In hazy weather, if unable to make the place out, steer for Saddle Hill, the most rugged part of the range.

At night, from the eastward, give a wide berth to Fishers Rock and anchor in the mouth of the cove near Ras Kalbu.

From the northward or westward, make Fahal Island, and steer direct to the mouth of the cove, anchoring as above directed. The shipping do not show well against the hills, especially at night, but when close, their hulls might be seen, especially from aloft.

Caution.—The greatest care is necessary when making the cove at night.

A British naval vessel entered the cove when a heavy swell was rolling in, but found no difficulty in picking up a berth. While swinging to her anchor the ship rolled heavily, but found a backward scend of the sea which greatly lessened the strain on the cable. She rode comfortably at anchor with 50 fathoms of chain out, although the wind and the sea continued fairly high.

Maskat town presents a picturesque appearance from the sea, but its interior, for the most part, is mean and squalid. The front is built close to the beach at the head of the cove. The walls are on the western and southern sides, the eastern and part of the southern side being close to, and even against the face of the hills. The suburbs of mat huts occupy every available piece of level ground in the vicinity. The population is estimated at 10,000 people of mixed races, but no regular census has ever been taken. There is not pretence at sanitation. The sultan's palace is the largest building on the sea front; the mosques are small, and have neither domes nor minarets. The British consulate is a large house, with a flagstaff, at the eastern end of the town. There are several towers on the surrounding hills, and the Buma Sali Tower, ¼ mile southward of the British consulate, on a ridge, the highest part of which is 500 feet high, is very prominent.

Maskat is a port of call for steamers, but the hills around prevent communication with the interior; Matra, 1½ miles to the westward supplies this want, and is the local center for the inland trade.

Supplies.—Considerable supplies are obtainable from the country, including firewood, sheep, cattle, vegetables, limes, oranges, grapes, plantains, and other fruits; fowls, flour, rice, dholl, soft bread, fish, and spirits are also procurable. These is no salt meat nor biscuit.

Coal.—There is no coal, patent fuel, nor oil fuel in the market.

Water from wells in the suburbs is carried to the landing place by a small aqueduct which runs by the side of the watercourse, and

is taken off to vessels in the anchorage by native boats in 50 gallon casks. After a long drought it is scarce and bad; it is not at any time now used for drinking purposes in British naval vessels.

Health.—Maskat is not unhealthy, although it is said to be one of the hottest towns in the world. The highest temperature recorded in 1912–13 was 114° F., and the lowest 64°. The high temperatures are due to the hot winds, which sometimes in summer, and generally for only a few hours at night, blow from the Arabian deserts and barren rocks round Maskat. For the greater part of the summer, owing to the high state of humidity of the atmosphere, in combination with a high temperature, the climate is very trying. From November until the middle of March the weather is pleasant, but fails to be bracing, as the temperature seldom falls below 60°. The average rainfall is 4 inches, and it is due to this that Maskat may be considered to be a fairly healthy port, provided ordinary precautions are taken if using shore water to purify it by boiling or filtration, and to protect oneself from mosquitoes, which, during winter, are numerous in the town and cause a considerable amount of malaria among the natives. There were no cases of cholera, smallpox, or plague during the year 1912–13, and only a few cases of dysentery and enteric fever among the native population.

Hospital.—The hospital, which is in charge of an officer of the Indian Medical Service, is situated to the westward of the British Consulate (lat. 23° 37′, Long. 58° 36′).

Consuls.—There is a British political agent and consul at Maskat. There are also an American and a French consul.

Communications.—In normal times the British India Steam Navigation Co. provide a fast mail service, and also a subsidiary mail service, weekly between Bombay anad Basra, and the vessels call at Maskat both ways. The vessels of the Arab Steamers (Ltd.) maintain an irregular service between Bombay and Basra, calling at Maskat. Vessels of the Bucknall Steamship Line and the West Hartlepool Steam Navigation Co. from London.

Maskat (lat. 23° 37′, long. 58° 36′) is connected by telegraph cable with Jashk, and thus with all parts of the world.

There are post and telegraph offices at Maskat, which have been established by the Indian Government.

Trade.—The exports consist chiefly of rifles and cartridges, dates, coarse cotton fabrics, mother of pearl, fruits, and dried fish. The imports, on which duty is levied without distinction, are rifles and cartridges, sugar, rice, cotton goods, wheat, coffee, silk, kerosene, twist, and yarn.

Manufactures are few. Certain kinds of cloths used by the Arabs are woven, and arms, such as swords, etc., are made here.

Shipping.—Several large square-rigged ships belong to Maskat, besides a great many bagalas and other native craft.

Currency.—The currency is the Maria Theresa dollar, and the debased copper coin minted in 1895 to the order of His Highness the Sultan. Sovereigns and other British coins are also current in Maskat and Matra. In the interior these coins are exchanged at a discount.

Trade accounts are kept in mohamadis and gaj, imaginary coins. There are two kinds of mohamadis, black and white, and 20½ black or 11½ white are equivalent to one dollar. The black is used in wholesale trade accounts and the white for fruits, vegetables, etc. Twenty gaj equals 1 white mohamadi; 11½ white mohamadis equal one dollar; 100 white mohammadis equal 1 tuman.

Weights and measures.—These are of two different kinds, one for the Sultan's customers and the other for retail bazaar use. Those used by the Sultan's customers are: One kiyas equals 6 dollars or 5.9375 ounces; 1 Maskat mann equals 144 dollars, or 24 kiyas, or 8 pounds 14½ ounces; 10 Maskat manns equal 1 farasilah; 200 Maskat manns equal 1 bahar.

There is another weight, called bahar, equals 400 Maskat manns, which is used exclusively for weighing salt.

Bazaar weights are: One kiyas equals 5.71 dollars or 5.67 ounces; 24 kiyas, or 137 dollars, or 8 pounds 8 ounces, equal 1 Maskat mann.

With the exception of rice, which is sold in bags, all cereals are sold by palli and farah (wooden bowls): Forty pallis equal 1 farah; 20 farahs equal 1 khandi. When measuring in palli the measure is heaped up.

The Indian rupee is taken as 1 tola, and is used for weighing perfumeries. The weight of a Maria Theresa dollar is called whoogiah, and is chiefly used in weighing amber: Six miskals equal 1 rupee weight; 8 miskals equal 1 dollar weight.

The measures are: One shibr equals 1 palm, or 4½ inches; 2 shibr equal ½ thraah, or 9 inches; 1 thraah equals 18 inches; 2 thraas equal 1 yard; 4 thraahs equal 1 baah; 1 baah equals 1 fathom. In all transactions the thraah is used.

Kalbu Cove (Kalbuh) extends about 60 yards southward, between the promontory terminating northward in Ras Kalbu and the promontory which terminates in Ras al Baz (lat. 23° 38′, long. 58° 35′), about 800 yards to the westward. A rocky spit, awash at high water, extends about 120 yards into the cove from about 100 yards southward of Ras Kalbu. Ras al Baz is a small isolated hill about 100 feet high, with a round tower on it; reefs extend some 70 yards around in places. There are depths of from 8 to 4 fathoms in the outer part of the cove, but this part is not used for anchorage, as it

affords but little shelter; in the inner part there are depths of from 4 to 1 fathom.

A sandy isthmus, on which is the small Doha village, connects Ras al Baz to the higher part of the promontory to the southward. Kalbu town, at the head of the cove, nearly joins the suburbs of Maskat to the southeastward; the people are the Bani Marazik Arabs.

Matra (Matrah) Bay.—Ras Kowasir, the western point of Matra Bay, 1,450 yards west-northwestward from Ras al Baz, is a precipitous point 150 feet high, with a rocky ledge, on which are some rocks 50 feet high, extending 300 yards eastward from it. There is also a small low islet 200 yards northeastward of the ras. Matra Bay lies between Ras al Baz and Ras Kowasir, and extends 1,400 yards southwestward. Riyam Cove lies in its southeastern part, and there are several small bays and villages around the bay, the town of Al Matra being at its head. Riyam Village is inhabited by the Bani Hamadi Arabs.

A detached hill about 100 feet high, on which stands Al Matra castle, separates Al Matra town from the large Mateira (Matairah) village, which is inhabited by fishermen. The remarkably sharp Matra peak, 1,010 feet high, the highest part of a range, lies 1,300 yards southward of the castle.

Rock.—A small rock, with 1½ fathoms water, lies 380 yards, 13° from the eastern tower of Al Matra castle.

Anchorage.—Matra Bay affords good shelter in a shamal, but is open to the nashi. The larger native vessels always anchor here, but square-rigged vessels seldom do so, using Maskat Cove in preference. The anchorage is close off the northwestern shore, between Ras Kowasir and Arbak South Fort, about 800 yards southwestward. The best landing in a nashi is on the rocks at the northwestern corner of the beach, westward of Arbak South Fort.

There is a red mooring buoy for lighters in about 3½ fathoms, on the western side of the bay.

Al Matra is under a wali or lieutenant governor. Its population is about 14,000, and most of the merchants of Maskat reside here. The town (lat. 23° 37′, long. 58° 34′), is chiefly mean and squalid; the part inside the walls is well built, and the Khojahs have a separate fortified quarter containing about 500 houses, into which only those of their own sect are admitted.

Communication.—The only pass from Maskat into the interior by land is through Al Matra, which, wherever the hills are accessible, is fortified on the land side by a wall and towers; there are also many detached towers on the hills round the town.

The route by land from Al Matra to Maskat is through Mateira, and thence either by a steep and rugged pass through Riyam or by a

very rugged steep pass direct to Maskat, but neither of these paths is practicable for laden animals. Everything is sent between these places by sea in large canoes, which ply regularly, and afford the general mode of transit.

Shateif Cove.—Ras ash Shateif (Shataifi) lies about ¼ mile north-northwestward of Ras Kowasir, and Shateif Cove extends a similar distance west-southwestward between. It is open to nashis, and is not used for anchorage. Shateif village, which is inhabited by fishermen, is insignificant. There is a footpath through the hills from Shateif to Arbak, a village on the north side of Al Matra. Ras ash Shateif is a vertical bluff, the northeastern end of a ridge about 200 to 300 feet high; it has deep water close-to.

CHAPTER III.

GULF OF OMAN—ARABIAN COAST.

RAS ASH SHATEIF TO SALAMA WA BINATASHA.

(Lat. 23° 38′, Long. 58° 34′, to Lat. 26° 30′, Long. 56° 32′.)

The coast from Ras ash Shateif trends westward, and is cliffy, about 1 mile to Ras Eint (Aiyint), a small projecting point, with Eint, a little village, westward of it.

Little Dar Sait is a small shallow bay westward of Eint; it is well sheltered by rocks, and small boats could safely anchor. There are a few huts on the shore, but there is no pass to the interior, and communication with Dar Sait is along the shore rocks.

Dar Sait (Darsait) (Lat. 23° 38′, Long. 58° 31′), the only village of any size between Ras ash Shateif and Ras Hamar, is situated on a sand and shingle beach, at the mouth of a deep wadi, about 2½ miles westward of Ras ash Shateif. The village is in two parts of about 40 huts each; a stone fort, 12 yards square, and about 15 feet high, in the front of the western part, is the only stone building; a smaller fort is hidden amongst the huts of the eastern part. There are two towers on the spurs of the hills, one on each side of the village; each is about 15 feet in diameter, the eastern is about 30 feet high, and the western, which is in ruins, 50 feet high. The wadi is full of palms, and from its head a path leads through the hills to Al Matra. Water for drinking is carried round from Little Dar Sait. There appears to be a considerable fishing trade.

Open anchorage can be obtained in about 6 fathoms, sand, ¼ mile northward of the village, but rocks extend a considerable distance off-shore on both sides, and a group of rocks projects nearly 200 yards off the western end of the beach. The beach is fairly steep-to, and landing in ordinary weather is easy, but it would probably be impracticable during either a shamal or nashi; the best place appears to be the western end of the beach.

Rock.—A rock with a depth of about 2 fathoms lies at about 600 yards northeastward of the eastward point of Dar Sait anchorage.

Close westward of Dar Sait is a remarkable red hill, about 400 feet high, showing two paps with cliffs at the base. Thence a sandy beach extends about a mile northwestward to Ras al Abyaz (Abyadh), a sloping point, and a little further westward is Ras al Hamar.

Ras al Hamar is a red cliffy point about 150 feet high.

Fahal, 2 miles northward of Ras al Hamar, is an island 700 yards long north and south, narrow, 280 feet high, precipitous and steep-to, with depths of from 14 to 38 fathoms round. The island is of a light color and generally shows against the land. Landing can only be obtained on its southwestern point, the cliffs overhanging all round. The passage between the island and the mainland is clear and deep.

The coast from Ras al Hamar trends southwestward and westward 20 miles to Sib, forming Kubbat al Hail, a large, sandy bay.

Mountains.—The hills trend southwestward from Ras al Hamar, and increase in height until they culminate in Jebel Tain (Tayin), 5,250 feet high, 21 miles from the ras. Their shape is not remarkable, but White Hill, about 8 miles southwestward of the ras and 4 miles inland, is distinguishable by its color.

Wadi Semail (Samail), a great valley, separates the ranges of Jebel Tain and Nakhl, the latter extending northeast and southwest on the western side. The Nakhl range has four principal peaks, the highest being 7,740 feet high. Jebel Nakhl (lat. 23° 20′, long. 57° 53′), 7,000 feet high, appears like a pepperbox on the top of the mountain. It is visible from off Maskat, but further westward becomes hidden behind other peaks until near Barka, 15 miles westward of Sib.

Soundings.—The 100-fathom curve is about 3 miles northeastward of Maskat Island and Fahal, and about 16 miles off Sib. The 20-fathom curve runs from Ras ash Shateif nearly straight to Fahal, and thence continues about 3 miles offshore until near Sib, where the flat begins, near the edge of which are the Daimaniyat Islands. The bottom is mud and sand, but, in upward of 2 fathoms, chiefly mud.

The Batina (Batinah) coast begins at Khuwair, 1 mile southwestward of Ras al Hamar, where the cliffs end, and extends westward and northwestward 150 miles to the neighborhood of Khur Kalba. It is low and sandy, with sandhills and date groves in places, and many towns and villages. The country inland for an average distance of about 12 miles is generally level.

This coast is clear of shoals, with the exception of those in the vicinity and southward of the Daimaniyat Islands, but has neither harbors nor creeks that will admit anything but very small boats. It is quite open to both shamals and nashis; for the latter it is a lee shore, consequently all trade with Maskat is carried on in boats which can be hauled up in bad weather.

Supplies.—Cattle, poultry, fish, and vegetables can be obtained at all the towns. Water is plentiful, but should be taken off in the

ship's boats; it is obtained from wells, often sunk but a short distance from the beach. Firewood can be procured, but the supply is very limited. Very fine dates are exported.

Kubbat al Hail—Villages.—Khuwair is a little creek where a large watercourse discharges; there are a few huts here, and mangrove trees that are cut for firewood.

Khalil is a small village, with fort and date grove, the first in the Batina district, about 11 miles westward of Khuwair, and 3 miles from the commencement of the sandy shore.

Hail (Hail) (Hail al 'Umair) is a little village on the coast, 3½ miles west-northwestward of Khalil; the date groves extend continuously from the village to 2 miles westward of Sib.

Sib (Síb), 4 miles west-northwestward of Hail (Lat. 23° 41′, Long. 58° 10′), is a scattered town, chiefly built of mat huts, with two small detached forts; several boats belong to it. There is a bazaar, extensive date plantings, and many gardens. Produce is sent hence to Maskat. Sib appears to be more fertile than other places in the neighborhood, and the palm trees are better tended. It is frequented in summer by visitors from Maskat, who erect temporary houses, being cooler and healthier than Maskat, and more open to all breezes. It is governed by a Wali.

Anchorage may be obtained in 5 fathoms, at about ½ mile from the shore.

Jebel Akhdhar.—From westward of Sib the great bluff of Jebel Akhdhar, 9,900 feet high, situated 43 miles southwestward of Suadi point, becomes visible; it has two steps on the upper part, the north face appearing nearly precipitous and the top sloping gradually westward from the steps. There are lower ranges between it and the coast.

The coast, low and sandy, projects a little westward of Sib, with date groves along it generally.

Ras al Ghaf is a broad low point 5 miles westward of Sib. Hereabouts there is a space of 4 miles with sandhills a little inland, and no date trees near the coast. The ras is named from two large ghaf or acacia trees on the most projecting part.

Shoal.—A sand-bank, with 3 fathoms water, lies 1½ miles northward of Ras al Ghaf; there is a depth of 4 fathoms in the passage between the bank and the land.

Daimaniyat Islands, called by Arab seamen Saba' jazair, lie nearly parallel with the coast, from 6½ to 8 miles offshore; they are all quite barren and without water, and are frequented by fishermen from the mainland, who come over in small boats called badan, and catamarans made of date stalks, called shashah.

Jazirat Kharaba (Kharabah), the eastern of these islands, situated 8 miles north-northeastward of Ras al Ghaf, is an islet about ¼ mile in extent and about 25 feet high, with black rocky points and white sand beaches between, which might show at night; a reef extends about a mile off its northern and eastern sides, and there are depths of 20 fathoms ¼ mile off it. There are several detached rocks around the islet.

The eastern islet of the middle group lies 3 miles west-northwestward of Jazirat Kharaba, and the group extends westward 3.7 miles. It is seven islets of different sizes in a line, with some detached rocks. The islets are from 30 to 40 feet high, with low cliffs of light brown color, difficult to see at night. The western and largest islet has two little hills with a valley between, and is 1,600 yards long and ¼ mile wide. They are said to be steep-to, with no outlying shoals. The soundings are no guide to approach them from inshore.

The western group, consisting of Jazirat Jun and three islets or rocks, lies 3½ miles west-southwestward from the middle group, the passage between being clear with about 19 fathoms water; the group extends westward 1½ miles. Jazirat Jun (lat. 23° 49′, long. 57° 59′) is 107 feet high near the western end, 1,600 yards long east and west, very narrow, of light brown color, and not easily seen at night.

There is tolerable anchorage on the southern side of Jazirat Jun in 7 to 8 fathoms, sand, about ¼ mile off a small sandy beach and sheltered from the northward, though much swell rolls round the island with strong winds. About ½ mile southward of Jazirat Jun is a 4½-fathom bank, with 8 fathoms between it and the island.

A 2-fathom spit extends about 300 yards southeastward from the western islet or rock.

Clive Rock lies about 1 mile 300° from Jazirat Jun; it is a detached patch about ¼ mile in extent, with 1½ fathoms water, coral rock, and 14 to 20 fathoms ¼ mile around. The rock is visible from aloft when the sun is in a favorable position.

Tides.—It is high water, full and change, at Jazirat Jun at 9 h. 30 m.; springs rise 10 feet.

Soundings.—The 100-fathom curve is about 4 to 6 miles northward of the Daimaniyat Islands; inside them the depths are fairly regular and less than 20 fathoms, except in the vicinity of the eastern group. In less than 20 fathoms the bottom is mud and sand; in deeper water, chiefly mud. There is a depth of 20 fathoms 1½ miles northward of Jazirat Jun.

Barka (Barkah).—The fort of this town lies about 10 miles westward of Ras al Ghaf; in the middle is the shaikh's castle, a lofty and conspicuous Arab fortress. There are four large flanking towers at the angles and many unserviceable iron guns in front of the gate. The rest of the town, consisting chiefly of mat huts, extends 3 miles

along the coast in the date plantations, which line it nearly to Ras al Ghaf.

The country near the town is well cultivated. Barka is under a Wali. Large quantities of dok, a shellfish resembling a cockle, are collected here, dried in the sun, and sent into the interior. There is a large bazaar and some Banyans. Supplies can be obtained.

Anchorage.—There is open anchorage 1 mile from the shore in 5 fathoms, sand, the depth decreasing regularly. The water is clear, and the bottom can be seen in 4 fathoms. Within 3 miles northeastward from the anchorage irregular soundings between 9 and 5 fathoms have been obtained.

Suadi Point, 7¼ miles northwestward of Barka Fort, is low and sandy with a sandhill; the date groves do not come within 1½ miles southeastward of the point.

Jazirat Suadi (Suwadi), consisting of one island and six islets, lie within about 1 mile from Suadi Point, and extend 1¾ miles east-southeast and west-northwest.

Jebel Add ('Add) (lat. 23° 43′, long. 57° 48′), the island, is 1,200 yards long east and west, 600 yards broad, and 280 feet high; it is table-topped; with a gap, and is cliffy to seaward. On its western side is a little sandy bay. The channel between it and Suadi point is 400 yards wide and dries 2 to 3 feet right across. The other islets, to the westward of Jebel Add, are precipitous, and from 50 to 150 feet in height; Mukbara (Makbarah), the southern, is nearly ¼ mile long, and has a tower on its southeast end, build in the piratical times to protect the anchorage. There is also a conspicuous tower on the summit of the western island.

Anchorage.—Between Mukbara and the shore is a boat anchorage about ½ mile in extent, with a depth of 6 feet close to the island, where native vessels anchor partly sheltered from the prevailing winds. It is crowded with boats in the date season; the entrance is close southwestward of the islet.

A small vessel might anchor, sheltered from the shamal, close off the southeastern side of Jebel Add in 4 fathoms, but she would be embayed if a nashi came on. There are depths of 4 and 5 fathoms close outside these islands.

Tides.—It is high water, full and change, at Jazirat Suadi at 9 h. 30 m.; springs rise 10 feet.

Water.—There is a well of good water on the beach about a mile westward of Jazirat Suadi.

The coast from Suadi Point trends west-northwestward and northwestward 114 miles to Khur Kalba; it is uniformly low, approximately about 25 feet high, sandy, and generally clear of outlying shoals, but is very little visited by Europeans. There are many

towns and villages, each one having a fort, more or less in ruins, and the date plantations are almost continuous, close to the sea.

A range of mountains, which appears to be continuous from Jebel Akhdhar to the entrance of the Persian Gulf, is visible from seaward the whole distance; it gradually approaches the coast to the northward, leaving only a narrow plain within Khur Kalba.

Soundings.—This coast has been very imperfectly surveyed. The 100-fathom curve is 7 miles northeastward of Jazirat Suadi, and 19 miles off Khur Kalba; the depths within this curve appear to be regular.

Anchorage.—Vessels should not anchor in less than 5 fathoms off this coast, especially during the season for shamals; within 5 fathoms, the bottom is very uneven and in places rocky. Landing is generally difficult.

Masna (Masn'ah), 8 miles westward of Suadi Point, is a village of mud and mat huts, with a fort in the middle. Bu Abali, a village, is situated 2¼ miles to the eastward, and about 1 mile westward are six conspicuous round trees. There is a depth of 3 fathoms 1 mile offshore in this locality. Between Masna and As Suwaik are four villages.

As Suwaik (lat. 23° 51′, long. 57° 26′), a town 20 miles westward from Jazirat Suadi, is partly walled around, and in the middle is a large and conspicuous fort with three high towers; it has also a bazaar, and there are many huts outside the walls. It is under the Wali of Barka, and has a garrison of the Sultan's troops.

Supplies.—Goats, fowls, sweet potatoes, and onions are procurable in small quantities at As Suwaik.

Al Khadhra, a village, extends some distance along the shore from 3 miles westward of As Suwaik. It has a fort, partly ruinous, at the eastern end.

Al Khabura (Khaburah) town is situated 20 miles west-northwestward of As Suwaik; there are four or five small villages on the coast between. There is a fort at Al Khabura.

At 25 and 20 miles, respectively, southwestward of Al Khabura are two conspicuous mountains; the more distant is about 3,000 feet high, bluff and quoin shaped, and the nearer is a double peak on the lower jagged range.

Ras al Hayari, 6½ miles northwestward of Al Khabura, is a village with two mud forts; the southern is square with one tower, the northern is square with three towers. There are many huts between the coast and the date groves at the back.

Dil (Díl), 4 miles northwestward of Ras al Hayari, has two low forts, with huts between them and the coast; the northern one is in ruins. There is a clump of dark green trees to the southward.

Makheilif (Makhailif) (lat. 24° 07′, long. 56° 56′), 2 miles northwestward of Dil, is a small village with a large high fort, which is the most conspicuous mark in this locality.

Sahm (Saham), 4 miles northwestward of Makheilif, is a large village with a low square fort, but owing to the date trees behind it is difficult to recognize. The fort is most easily distinguished on a west-southwesterly bearing; it has two towers, but they rise only a little above the rest of the building; there are two high palms in front of it. About ½ mile southward of the fort is a tower, the top of which is broken; it is noticeable from the southward but not from the northward. The huts of the village extend about 1 mile along the coast.

Sohar (Sohár), 13 miles northwestward of Sahm, is a walled town, with a fort, which can be seen before the date trees become visible. There is a moat around the town and a large bazaar. Many mat huts are built along the beach in the date groves outside the walls. In the fort are several large round trees. The town, which is under a Wali, has a population of about 5,000; the shaikh lives in the fort.

Sohar Peak, 12 miles southwestward of the town, is 1,550 feet high, conical, and of light brown color; it rises from the plain in front of the back range of mountains and is a good mark.

The date groves are quite continuous on the coast in this locality.

Anchorage can be obtained in 5 fathoms, sand, 1 mile of the town.

Al Faska (Fasikah), about 7½ miles northwestward of Sohar, is a straggling village, with a fort on a slight rise at its northern end. In the rear of the middle of the village is a fort, with two conspicuous date trees in front of it. There is an isolated bushy tree on the beach northward of the village.

Majis (Majís), the largest village between Sohar and Shinas, is situated northward of Al Faska, and it has a manufactory of the cotton canvas used by native craft.

Harmul (lat. 24° 30′, long. 56° 37′), 4 miles northwestward of Al Faska, is a date-stalk village, with no buildings. Luwa (Liwa), 2½ miles inland from Harmul, is a large square fort, with a square tower in the middle; the fort shows above the date trees from seaward.

Shinas, 27 miles northwestward of Sohar, is a considerable town. The fort is a large one, and from the southeastward presents a long front; it has three towers, that at the northern end being higher than the others and the highest anywhere in the vicinity. This town shows well against the trees behind, except from the northward, from which direction only the highest tower is visible. A khur extends along the whole front of the place; the entrance, about 1½

miles northward of the town, may be known by a small sand hill on the beach and the break in the date trees. Generally there are dhows in the creeks both northward and southward of the town.

Anchorage.—There is anchorage in 5 fathoms a little northward of the town, off the entrance to the khur, which boats must enter to land. The water shoals gradually. Landing is difficult with on-shore winds owing to the surf.

Mureir (Murair), about 14 miles northwestward of Shinas, is a village with three large towers, two at the northern and one at the southern end, the latter in ruins. A mile to the southward is a large fort with two ruined towers and several mat huts. The Batina coast ends about 1 mile northward of Mureir, and about 3 miles northward of the village a dark ridge of hills slopes down to the coast.

There are three small villages between Shinas and Mureir.

Khur Kalba, 5 miles northward of Mureir, is a village and fort with about 200 men; there is a creek available for boats at high water.

Sohar Peak becomes triangular in appearance when bearing southward of 225°, and from off Khur Kalba, it looks like a light brown triangular island.

The coast from Mureir to Dibba is called Ash Shameiliya (Shamailiyah); it is under the government of the Shaikh of Sharja, the Jowasim chief; from Khur Kalba it trends northward 36 miles to Ras Dibba, where it turns westward about 5 miles to the town of Dibba. The coast is cliffs with sandy bays, in which are villages and date groves, the coast plain becoming narrower to the northward; 15 miles northward of Khur Kalba the hills come close down to the sea.

Soundings.—There are depths of about 30 fathoms from 2 to 4 miles off this coast, whence it shoals regularly but quickly toward the land. From about 20 miles eastward of Khur Kalba the 100-fathom curve trends northeastward to Ras al Kuh on the Persian coast, the depths decreasing northward; there is a depth of 50 fathoms 9 miles off Khur Kalba, and probably about 5 miles off Ras Dibba.

Ghalat Kalba (Ghallah or Kalba) (lat. 25° 4′, long. 56° 20′), about 3 miles northward of Khur Kalba, is a large village with from 200 to 300 men, and a dilapidated Arab fort, a large square castle like building with a square tower.

Al Fujaira, 6 miles northward of Khur Kalba, and 1½ miles inland, is a town with a population of about 500 men: it consists of a conspicuous square Arab fort, with towers, and surrounded by huts, standing amongst date trees. The landing place, called Gherefa, is marked by a conspicuous large white square house, in ruins. Supplies can be obtained and there is plenty of fresh water.

The journey across the mountains from Al Fujaira to Sharja, on the west coast of Oman Peninsula, occupies 2½ days.

Shoal.—A sounding of 2 fathoms has been found about 1½ miles eastward of the shore abreast Al Fujaira; inshore of the shoal the water deepened to 5 fathoms.

Anchorage can be obtained in 5 fathoms water about ¾ mile mile from the beach.

Sakamkam, about 3 miles northward of Al Fujaira, is a small village with about 50 men. The only mark for this place from seaward is a round tower some distance inland.

A little northward of Sakamkam is a steep rocky black point, between which and Khur Fakan is a plain dotted over with black hillocks varying in height, resembling gigantic mole hills.

Khur Fakan (Fakkan), 11 miles northward of Sakamkam, is a sandy bay, on the southern shore of which is a village with a large date grove. Immediately southward of the bay is a hilly projection from 1,000 to 2,000 feet high, and there is a peaked island ¼ mile long northwest and southeast, 300 yards broad, and 240 feet high, off its northeastern point, the channel, 400 yards wide, inside it having 3¼ fathoms water. The entrance to the bay, between the peaked island and Ras Luliya (Luluiyah), the northern rocky point, is 1½ miles wide.

The depth in the bay decreases regularly from 9 fathoms in the entrance. The anchorage, in 6 fathoms, sand, ½ mile from the village, is open to the nashi. Eastward of the village, and on the northern side of a cliffy point with two towers, a little cove recedes about 300 yards; it has a sandy beach at the head and 3 fathoms in the entrance, where small boats anchor, quite sheltered. The chief of the place is a tributary of the Shaikh of Sharja.

Supplies.—Excellent water can be procured with but little delay, but supplies, such as cattle, poultry, vegetables, etc., are not readily procurable, as they have to be brought from the villages on the coast to the northward; it is better, therefore, to anchor off these villages and obtain provisions direct. Fish (rock cod, etc.) is plentiful. Firewood can be obtained from the country with two or three days' notice.

There are about 150 men here, and the natives in the locality have been reported as being friendly.

The coast northward of Ras Luliya is low and sandy for about 4 miles, with date groves, the mountains being but a short distance inland. Zubara is a small village 1¾ miles northward of the ras.

Al Badi, an islet about 200 feet high, lies close to the shore, 3¼ miles northward of Ras Luliya; Al Badi village is on the coast a little northward of it. Between Al Badi and Ras Dibba, 11 miles to the northward, are Karam (Sharam), Zadna (Dhadnah), and Ruwul

Zadna (Rul Dhadnah) villages. The coast is rocky points and sandy bays, the mountains rising abruptly a short distance inland.

Dohat Dibba (Dibah).—Ras Dibba (lat. 25° 37′, long. 56° 22′) is a projecting point of cliffs of moderate height, with an islet ¼ mile northward of it, the channel between the islet and the shore having 2 fathoms water. There is a white patch on the cliffs 1 mile to the westward. The bay is 5 miles wide, and open between east and north-northeast; the depths decrease regularly from 15 fathoms in the entrance to the sandy beach. The town and fort, 5 miles westward of Ras Dibba, have about 2,000 men; there are extensive date plantations in the valley southward of the town.

Supplies.—Good water, vegetables, etc., and cattle can be obtained here.

Ras Suwat, 4½ miles north-northeastward of the town of Dibba, is the rocky northern point of Dobat Dibba. About 1 mile northward of Dibba is Al Karsha village with about 50 men.

Ruus al Jebel (Ruus-al-Jibal).—Northward of a line drawn west-northwestward across the land from Dohat Dibba to Ras al Khaima, in the Persian Gulf, is the great promontory of Ruus al Jebel (tops of mountains, the northern portion of which is the Musandam Peninsula. The eastern and northern parts westward to Khasab are under the Maskat Government, and thence to Ras al Khaima it is under the chief of the latter place.

The coast from Ras Suwat trends generally north-northeastward, 39 miles, to Ras Kabr Hindi, the eastern point of Musandam Peninsula; it is precipitous throughout, the cliffs generally overhanging near the sea, having been undercut by the action of the water; there are small sandy bays at the mouths of the valleys, and the mountains rise abruptly from the coast.

The promontory is indented by numerous deep-water inlets, some of considerable extent.

The land is everywhere barren, except in a few little valleys where date-groves, etc., are to be found. In some of the fissures of the hills there is a scanty vegetation, which serves as food for goats.

The mountains, apparently bare rock, present a grand and wild appearance, and infested by wolves, leopards, hyienas, and foxes. The paths across them are generally tracks fit only for goats or Arabs.

Inlets.—The inlets inclosed by the bare precipitous mountains have a most remarkable appearance. In them the winds are very baffling, and consequently, though any of them can be entered by a steam vessel, entering or leaving is difficult for a sailing vessel; in most, the great depth of water is a further difficulty, rendering it tedious to attempt warping. The larger Arab vessels never visit them, nor any native vessel not propelled by oars; should a sailing

vessel enter one, the best time to leave would be at night, taking advantage of the light land wind which then often blows.

Inhabitants.—The inhabitants of the promontory are chiefly of the Shuhiyin tribe, speaking a very corrupt dialect of Arabic, and are herdsmen or fishermen. During the date harvest they are absent from their homes, employed either in Batina or Khasab. They are for the most part inoffensive and extremely poor, very ignorant and superstitious; some of them seem scarcely to know the use of money. Dates and rice are the most acceptable presents.

Mountains.—From the eastward the range of mountains has two principal peaks; Jebel Kawa, the southern, 5 miles west-northwestward of Ras Suwat, is 5,800 feet high, with a small notch in the top; Jebel al Harim (Shuam (Sha'am) peak) (lat. 25° 59′, long. 56° 16′), the northern, is 6,750 feet high, with a truncated or small table top, having a little notch in the southern part.

Soundings.—There are no known shoals off this coast; southward of Ras Bashin there is a depth of about 40 fathoms about a mile off shore, and from 60 to 65 fathoms, the deepest water in this part of the entrance to the gulf, 10 miles off, but there are 70 fathoms 2 to 3 miles eastward of Jazirat Umm al Faiyarin. Northward of Ras Bashin there are depths of 70 fathoms close to the points, and of 80 and even 100 fathoms just off Musandam Island; the water shoals to 50 and 40 fathoms half way across to the Persian coast.

Ras Haffa (Haffah) (lat. 25° 44′, long. 56° 19′), 1½ miles northeastward of Ras Suwat, is the southern point of a narrow promontory on the eastern side of Dohat Haffa; the promontory is moderately high, and decreases in height towards the ras.

Dohat Haffa, the cove running 2½ miles northward inside the small promontory just mentioned, varies from ¼ to ½ mile in width, and has depths of from 7 to 8 fathoms. The cove, which is quite landlocked, is not noticeable from seaward. There are only a few fishermen here.

Khur Mala is situated 3½ miles northward of Ras Haffa; the intermediate coast is cliffs, with depths of 20 fathoms at a distance of 400 yards to 600 yards. The khur, which is narrow, recedes about 1,600 yards; its shores are irregular, and the depth decreases from 8 fathoms in the entrance.

A cove, situated 3¼ miles northward of Khur Mala, extends westward 1 mile; half way in it narrows to about 400 yards in width, but its inner part is ½ mile wide; there are 8 fathoms water in the entrance, and 3 fathoms in the inner part. There is a small village with a date grove on the southern side of the head.

There are several other small indentations between Khur Mala and this.

Dohat Sharja (Sharjah), northward of the cove just mentioned, and separated from it by a promontory ¾ mile wide, extends 1¼ miles westward, with a width of about 1,200 yards; there are depths of 20 fathoms in the entrance, and the water shoals gradually toward the sandy beach at the head; it is open eastward.

The coast from Dohat Sharja trends north-northeastward 3 miles to Ras Hamra, and then turns northwestward 1¼ miles on the southern side of Kubbat Akaba. It is precipitous, with Lima Peak, about 2,000 feet high, 1¼ miles southwestward of Ras Hamra; the peak, from the northward, is a fine cone. About 3 miles west-southwestward of it is a saddle mountain, somewhat higher, and also conspicuous from the northward. From the eastward these mountains do not show against the higher land behind.

Kubbat Akaba (Ghubbat Akabah) extends northwestward about 2 miles from its entrance between Ras Hamra and Ras Samut, 2¼ miles northeastward; the depth decreases from 23 fathoms in the entrance to 10 fathoms near the shore. Akaba, on the shore of its northwestern corner, at the mouth of a valley, is a small village, with some 90 men, and there is a short way from it by land through the hills to Lima. Close off the village boats shelter from nashis, the worst winds on this coast.

Ras Lima (Limah), 1½ miles northeastward of Ras Samut, is the termination of a narrow, precipitous promontory. Jazirat Lima (lat. 25° 56′, long. 56° 28′), 700 yards eastward of the Ras, is 600 yards long east and west, about 400 yards broad, 285 feet high, and precipitous. There is a depth of 20 fathoms in the channel between it and the Ras, and a small detached rock near the island. The tidal currents are strong through the channel. There are 30 fathoms water close eastward of the island.

Lima.—A sandy bar, 1 mile in extent, lies 1½ miles westward of Ras Lima, at the mouth of the valley in which is Lima village, with about 200 men. The village is on the southern side of the bay, and part of it extends up the hill, on the steps of the strata, one hut above the other; there is a date grove and some cultivation in the valley. A spit extends about 400 yards from the shore near the date grove northward of the village.

Lima was visited by a naval vessel and the natives were found to be armed and hostile.

The mountains in this locality rise suddenly to great heights. At the northern end of Lima sandy bay is a high precipitous hill, off which are four rocky islets from 10 to 30 feet high.

Anchorage, open eastward and northeastward, can be obtained off Lima in about 12 fathoms. A little bight used by the native boats, on the southern side of the bay, close to the cliffs, affords the best landing place in easterly winds.

Supplies.—When the people are friendly, cattle, etc., are procurable here, but good water can not be obtained in any quantity except perhaps from a distance. Firewood can be got in a day or two. The people here say that they can cross over to Ras al Khaima in one day, and that there are ponds of fresh water in the mountains, distant half a day's journey.

The coast from Lima trends northward 5 miles to Ras Samid, a high cliff, the southern entrance point of Dohat Kabal. Ras Marovi, off which are two small rocky islets, some 25 feet high, is midway between; on its southern side is a bay nearly 1½ miles wide, with a patch of sandy beach. Between Ras Marovi and Ras Samid are several small points and bays; a rock, 25 feet high, lies 1¾ miles southward of Ras Samid and nearly ½ mile off-shore, with 22 fathoms inside it.

Duhat Kabal (lat. 26° 2′, long. 56° 26′) extends westward 2 miles, with a general width of 1¼ miles, and then a narrow cove turns southward 1 mile, to a sandy beach at its head. The shores are very indented, with little beaches in the bays; the points all cliffs. About 1 mile southwestward of the cove the mountains rise like a wall, forming a tremendous bluff, over 4,000 feet high. The depth decreases from 25 fathoms at the entrance to 13 fathoms at the bend, and thence to 4 fathoms, which is charted at the head; but an anchorage in 7 fathoms 300 yards from the head has been found and that from 5 fathoms the water shoals suddenly to the beach.

The cove teems with fish and is frequented by fishermen from Lima; a few poor herdsmen live in huts scattered over the valley at the head. In the western branch of this valley or watercourse are the ruins of an extensive village, the walls of which were built of large slabs of stone, without mortar. There is a little born hill on the summit of the lofty cliffs at the northern entrance of the bay, and thence the cliffs run northeastward 3 miles in an unbroken line of irregular height, deeply furrowed, becoming lower to the northward and terminating in Ras Sarkan.

Ras Sarkan, a vertical cliff of considerable height, is the southern entrance point of Kubbat Gharzira. There is a depth of 40 fathoms within ½ mile of it.

Kubbat Ghazira (Ghubbat Ghazirah or Malcolm Inlet) is 2½ miles wide at its entrance, between Ras Sarkan and Ras Dilla, and extends 9 miles west-northwestward. Its shores are precipitous and high except where valleys terminate in a few little sandy bays, and are deeply indented. There are two principal inlets on the southern side, the outer 1¼ miles, the inner 2¼ miles deep, both running south-southwestward; in the former is a village. Habalain village is situated in a small bight at the head of the kubbat.

On the northern side of the kubbat are two large inlets, each extending 3 miles northeastward, separated by a high and rugged peninsula. Mukaka (Mukakah) Village is on the shore of the western inlet. The northern side of this inlet is the narrow ridge or isthmus connecting the middle of the northeastern coast of Ruus al Jebel Peninsula to Musandam Peninsula. In places this isthmus is only about 600 yards wide, and on its northern side is Khur ash Shem, entered from the Persian Gulf. At the head of the outer or eastern inlet is Filam (Film) Village.

Depths.—There are depths of from 36 to 25 fathoms in the main part of the kubbat, and from 25 to 12 fathoms in the inlets, with 20 fathoms, except in places, close to the cliffs; the bottom is chiefly mud, but it is rocky in the entrance.

Tides.—It is high water, full and change, in Kubbatt Ghazira at 9 h. 30 m.; springs rise 10 feet.

Musandam Peninsula is most irregular in form, being a series of small, lofty peninsulas and headlands, inclosing numerous inlets of various sizes. Many of the inlets are good harbors, though the water is as a rule inconveniently deep, but, owing to the intense heat in summer, they can hardly be used then even as temporary anchorages. An attempt to establish a telegraph station on this peninsula proved a failure through the unfitness of the climate for Europeans. Two, at least, of its peaks rise to a height of 3,000 feet, and others about 1,000 feet. From its junction with the peninsula of Ruus al Jebel to Ras Sharita, its northern extremity, the distance is about 12½ miles; and the extreme width of the peninsula is about 10½ miles.

Ras Dilla (lat. 26° 8′, long. 56° 29′), the eastern extremity of the southeastern of the peninsulas, is a vertical cliff, from 200 to 300 feet high, with a conical summit. The peninsula, which commences at Filam Village, is 5 miles long, and has a remarkable brown-colored peak, over 1,000 feet high, with a little round knob on the top at its widest part. It separates Kubbats Ghazira and Shabus. The soundings off it are from 33 to 49 fathoms, and irregular.

On the northwestern side of Ras Dilla is a bay about 1,400 yards in extent, with 15 fathoms water, open to the northeast.

Kubbat Shabus (Ghubbat Shábús).—The coast from the bay just mentioned trends northward about 1 mile to a point between which and Ras Bashin, 1¾ miles to the northward, is the entrance to Kubbat Shabus. The southern shore of Kubbat Shabus trends westward about 1 mile and then turns northward 3 miles. The shores are high cliffs, with little sandy beaches in places. There are depths of from 33 fathoms in the middle to from 20 to 12 fathoms near the shores. Shabus village is in a little bay on the southwestern

side. In the northern part are two villages. Jebel Sibi, about 1 mile westward of the head of the kubbat, is 3,000 feet high, and a remarkable cone with a flat, scalloped top.

The peninsula, of which Ras Bashin is the southeastern extremity, is 4 miles long north and south, about 1½ miles broad, and the isthmus between it and the land under Jebel Sibi is 1 mile broad. Kaisa Peak, in the northern part of the peninsula, is a conical hill over 1,000 feet high and of light color. Ras Bashin is about 100 feet high and of light red color; an islet lies about 1,600 yards northeastward of the ras, not far from which and near the shore the Arabs report a reef, called Abu al Mawar, with 1 fathom water. Ras Kaisa, the northeastern point, is about 100 feet high and of light red color; an islet lies 300 yards off it. There are depths of 30 fathoms close off Ras Bashin and Ras Kaisa, and 70 fathoms about 1 mile off the latter.

Jazirat Umm al Faiyarin (Fayárín) (lat. 26° 11′, long. 56° 33′), 4½ miles eastward of Ras Bashin, is about 800 yards long north and south, ¼ mile broad, and 360 feet high. It is of light color; the west coast is precipitous, but possibly access could be obtained on the southeast coast. There are depths of from 55 to 60 fathoms near its eastern side, and from 38 to 42 fathoms between it and the shore.

Tidal currents.—The tidal current from the vicinity of Jazirat Umm al Faiyarin sets northward along the coast to Musandam Island, and thence northwestward toward the Salama wa Binataha, and westward toward Ras Sharita, from about five to two hours before until one to four hours after high water, and in the opposite direction from one to four hours after high water until from five to two hours before the next high water, but the times of the turn are very variable.

The velocity of the currents is about 2 to 3 knots, but off Ras Musandam it attains about 4 knots, and probably more at springs.

Caution.—The tidal currents being very strong near Jazirat Umm al Faiyarin, and from its vicinity to Ras Musandam and the Salama wa Binataha, with eddies and races, especially near the ras, sailing vessels should avoid approaching this part of the entrance, especially as the wind is uncertain near the high land, often failing or shifting suddenly to the opposite quarter.

Dohat Shisa (Shísah) extends westward 5 miles from its entrance, between Ras Kaisa and Ras Kabr Hindi, 5 miles north-northeastward, with general depths of from 30 to 40 fathoms, and from 15 to 20 fathoms close to the cliffs. Its shores are precipitous and irregular, with some little sandy beaches in the coves. There are three islets halfway in on the northern side, the southern and largest of which, about ¼ mile long and 100 feet high, is named Red Island from its color. Shisa, an old village of only a few huts, stands on

the western side of the southern part of the inlet. A new village, with probably 200 inhabitants, has sprung up about 1¾ miles farther northwestward.

The southwestern shore of the inlet is separated from Khur ash Shem by a ridge, in one part only about ¾ mile wide, and the western shore is separated from Khur Ghub Ali by a similar ridge not much wider.

Ras Kabr Hindi (lat. 26° 19′, long. 56° 31′), about 1,200 feet high, is precipitous, with three scallops on the top; there are from 46 to 53 fathoms ½ mile to 1 mile off it. This is the easternmost point of Musandam Peninsula, and it is distant 31 miles from the nearest coast of the Biyaban Province of Persia.

The coast from Ras Kabr Hindi turns westward 1 mile, and then trends northward 2 miles to Ras al Bab.

Ras al Bab, the northeastern point of Musandam Peninsula, is a vertical limestone cliff, about 200 feet high. The ras and all the islets off the northern part of Musandam Peninsula are undermined in places for yards, by the action of the sea and tides.

Fak (Fakk) al Asad, a strait 600 yards wide, lies between Ras al Bab and Musandam Island to the northeastward; it is quite clear, and has a depth of 24 fathoms. The strait is frequently used by steam vessels, but great attention must be paid to the helm, and the vessel must ke kept in as near mid-channel as possible. Owing to the strong tidal currents and baffling winds, it is not safe for sailing vessels; the Arabs only venture through in pulling boats. The northwest-going currents sets against the cliffs on the western side of the strait, and the southeast-going on the southwestern part of Musandam Island.

Musandam Island is nearly 2 miles long north and south, 1½ miles broad at the southern end, 875 feet high, of triangular shape, and precipitous all round, except in three or four small coves on the eastern side, where are the only landing places. The highest part is near the south coast, and has three little peaks. There are some remains of buildings on the northern part, which were constructed of large stone blocks without mortar. There are generally a few herdsmen here, with flocks of goats; its coasts are frequented by fishermen from Kumzar.

Ras Musandam, the northern point of the island, is a cliff about 100 feet high. A sounding of 104 fathoms have been obtained about 3 miles eastward of Ras Musandam, and this is the greatest known northward of Ras al Kuh.

Kachal (Kachalu), ½ mile north-northeastward of Ras Musandam, is a rocky little pillar or islet, 100 feet high, with a clear passage between it and the ras. A sounding of 99 fathoms, with no bottom, has been obtained about 1 mile northeastward of the islet.

Salama wa Binatah (Salamah wa Binat ha), or the Quoins, is a group of three islets, extending 2 miles northwest and southeast.

Little Quoin, 4¾ miles northward of Kachal, is about 600 yards long north and south, 300 yards broad, quoin or wedge shaped, with the highest and vertical part to the southward; the northern extremity is also a small bluff. It is accessible on the northern side only, off which a small spit extends north-northwestward.

Little Quoin Islet Light, group flashing white, 196 feet above high water, visible 20 miles, is exhibited from a lighthouse on the summit of Little Quoin Islet. The light is obscured by Gap and Great Quoin Islands. For arcs of obscuration see Light List and chart.

The lighthouse is a white framework tower 79 feet high.

Gap Island, 1 mile north-northwestward of Little Quoin, is about about 600 yards long northwest and southeast, 300 yards broad, with a peak about 250 feet high near the middle and cliffs all round. A small rocky patch with less than 6 feet water lies 400 yards southward of the island.

Great Quoin (Saláma) (Salámah) (lat. 26° 30′, long. 56° 31′), ¾ mile west-northwestward of Gap Island, is about 800 yards in extent, 540 feet high, and quoin or wedge-shaped, with the vertical side to the southeastward. It is accessible on the northwestern side only; a small detached rock lies about 80 yards off its northern side.

Depths.—There are from 45 to 50 fathoms close to the Great Quoin and from 50 to 76 fathoms southward of the Little Quoin, the depth increasing toward Musandam Island.

Tidal currents.—The tidal currents set northwest and southeast about the Quoins at a rate of 3 knots or more at springs. A sailing vessel should not pass southward of the islets, as the wind often fails in their vicinity, and the tidal current then renders a vessel unmanageable. Near Kachal and Tawakkul Islet the currents are strongest, with broken water; in calm weather, at springs, the noise of the races can be heard from some distance.

CHAPTER IV.

PERSIAN GULF—COAST OF OMAN.

SALAMA WA BINATAHA TO ABU THABI.

(Lat. 26° 30′, long. 56° 32′ to lat. 24° 29′, long. 54° 22′.)

The north and west coasts of Musandam Peninsula and the west coast of Ruus al Jebel Promontory rise steeply to mountains southward to Shuam, where the mountains turn southward, and the coast, which trends southwestward, becomes low and characteristic of the whole southern shore of the Persian Gulf. The sea water is everywhere clear and transparent.

Mountains.—From the northward, except when very close to the land, Jebel al Harim, with its small table top shows above the other mountains; Fine Peak, about 18 miles northwestward of Jebel ay Harim, does not show well against the higher mountains behind, when bearing between about 140° and 170°.

Tawakkul Islet, called by fishermen Suwaik (lat. 26° 24′, long. 56° 30′), 1¾ miles west-northwestward of Ras Musandam, is about ¼ mile in extent, 460 feet high, and precipitous, with very deep water close to. It much resembles the Great Quoin (Salama) in apearance.

Rak Suwaik, 1,500 yards westward of Tawakkul, is a rocky patch 50 yards in extent, with 1½ fathoms water and from 47 to 57 fathoms close around. Kachal Islet open northward of Tawakkul leads northward of the patch. Numerous small birds often hover over it.

Jazirat Kun, 3½ miles west-southwestward of Ras Musandam, is about 1 mile long east and west, ½ mile broad, 600 feet high, with a depression in the middle, forming a kind of saddle, and precipitous.

The north coast of Musandam Peninsula is several projecting points with bays between, in all of which there is deep water. The largest bay is southeastward of Jazirat Kun, and the entrance, 1 mile wide, is between two narrow projecting cliffy points; it is precipitious all around.

The bay southward of Jazirat Kun has a few huts on a sandy beach at its head; immediately southward of the head is Jebel Maili, a sharp peak, 1,894 feet high, which, on southerly bearings, slightly overhangs to the eastward.

Kumzar.—West-southwestward of Jazirat Kun is a bay extending southwestward about 1 mile, with a width of about 1,400 yards; it is open to the nashi, which is often strong in winter. The depth

decreases from 32 fathoms in the entrance to from 20 to 17 fathoms, sand, at the anchorage at the head.

Kumzar, a town at the head of the bay, with a population of about 500 men, is under the control of a wali appointed by the sultan of Maskat, and occupies a gloomy valley or gorge in the hills. The inhabitants are fishermen, and possess 50 to 60 boats of different sizes; they take salt fish, shark fins, etc., to Kishm. About 1¼ miles southwestward of Kumzar is a roundtopped mountain, 2,000 feet high.

Water can be obtained from a deep well some distance up the watercourse.

Ras Mukhalif is the northern extremity of the projecting point on the west side of the bay just mentioned.

Jazirat Abu Sir, northward of Ras Mukhalif, is 1,200 yards long, north and south, and ¼ mile broad, with cliffs around; near its southern end is a peaked hill, about 400 feet high. Bab Mukhalif, between it and Ras Mukhalif, is ¼ mile wide, with a high precipitous rock nearly in mid-channel, and a depth of 35 fathoms. The tidal currents through the strait are strong with eddies.

Mushkan Rocks (lat. 26° 24′, long. 56° 25′), about 1,400 yards north-northwestward of Jazirat Abu Sir, are a group of several detached white rocks close together, 15 feet high. The passage between Jazirat Abu Sir and the rocks is 1,200 yards wide, with depths of from 20 to 25 fathoms, and there is a depth of about 70 fathoms a mile northward of the rocks.

The coast.—Between Ras Mukhalif and Ras Sharita, 2¼ miles west-northwestward, are three coves, with deep water, open to the northward. In the eastern is a small nook at the head forming a boat harbor, with a few huts and a well of water; the middle cove is named Dohat Khulte, and the western cove Dohat Ferrta.

Ras Sharita is the northern extremity of a narrow promontory, 1 mile long, the southern and highest part of which is a round hill, about 450 feet high; the promontory is precipitous all around except that it is joined to the mainland by a short sandy isthmus, about 20 feet high. Perforated Rock, 200 yards northward of the ras, is nearly 100 yards in extent, and about 40 feet high, with vertical sides, and a hole through it. There are over 70 fathoms within 1 mile northeastward of the rock, and 33 fathoms midway between it and Mushkan Rocks.

Rock.—A rock on which the steamship *Griqua* struck in 1909 is reported to be 1 mile, 340°, from Perforated Rock.

Jazirat al Ghanam, westward of the coast southward of the promontory of Ras Sharita, is 2¼ miles long north and south, and ¾ mile broad. It has cliffs nearly all around; the northern point is about 250 feet high, but the land rises gradually to 550 feet near the southern end, where the cliffs are about 200 feet high. There are

depths of 45 to 38 fathoms ½ mile westward of it. The island is barren, without water or inhabitants, but there are a few goats belonging to the Kumzar people.

Khur Kawi (Kuwai), the strait between Jazirat al Ghanam and the mainland, is 600 yards wide at either end, widening to ½ mile within, with depths of from 11 to 19 fathoms, sand and rock. Pier Point, a point of rock from 30 to 60 feet high, like a pier, projects eastward from the northern end of the island, and in the bay southward of the point, a reef extends about 200 yards from the shore.

There are two small inlets on the eastern shore of the khur: Sidi Bay, about 800 yards within the northern entrance, and a cove about 800 yards farther southward, on the northern side of East Middle Point (lat. 26° 21′, long. 56° 22′); both dry.

There are no inhabitants on the shores of Khur Kawi; the nearest place of any importance is Kumzar.

Anchorage.—To enter the khur for shelter, etc., take the northern entrance, and, guarding against the tidal current in the approach, where it sets east-northeast and west-southwest, anchor as convenient in from 13 to 17 fathoms. On account of the eddies during the northgoing current, and also of its rate, do not anchor within about ¾ mile from the southern entrance; about ½ mile southward of Pier Point the eddies are strong; the bottom is sand, gravel, and soft or broken coral.

The anchorage is safe for steamers; it is not recommended as a place of shelter for sailing vessels, as there might be difficulty in getting to sea again; such should cross the gulf to Henjam, or Kishm anchorage; or, in a shamal, if possible, get into Khasab Bay.

Tides and tidal currents.—It is high water, full and change, at Khur Kawi, at 10 h. 15 m.; springs rise 8 feet. The current sets northward from three hours before until three hours after high water at a velocity of about ¾ knot, and southward from three hours after high water until three hours before the next high water at a velocity of from 1½ to 2 knots. There are strong eddies during the north going current in the southern part of the khur.

Temperature.—During summer the heat in Khur Kawi is intense. For three days early in August, 1906, with a free circulation of air under double awnings on board of a naval vessel, the lowest temperature by night or day was 90°, and the highest 99°. The temperature of the sea at the same time was 90°.

Bay.—Southward and southeastward of Jazirat al Ghanam is a bay 1 mile wide and extending 1¼ miles eastward. Gharum or Southeast Cove, in its northeastern corner, is about ¼ mile deep at the mouth of a valley, with date plantations and a few fishermen's huts; there are some wells with good water here. South Cove, at

the southeastern extremity, is a bight with Kabba (Kabbah), a little village, at its head. The few people of these villages are nearly all absent during summer.

Khur Ghub Ali (Ghubb 'Ali).—The entrance to this khur is about 1¾ miles southwestward of the bay just mentioned, and the khur extends southeastward 3½ miles, with an average width of 1,600 yards. The north entrance point is a cliff about 300 feet high, and the northern side of the khur rises to a conical hill about 800 feet high. The south entrance point is also a cliff about 300 feet high. There are 28 fathoms water in the entrance, 14 fathoms ½ mile from, and 6 fathoms near, the head of the cove.

Ghub Ali is a small village on a sandy beach at the head, with a few date and other trees, and good water.

The coast from Khur Ghub Ali trends southward 4 miles to the entrance to Khur ash Shem, and is the western side of Shem Peninsula about 1½ miles from the southern extremity of which, Jebel Shem, a remarkable peak, rises to a height of 3,000 feet, with a huge precipice on its southeastern side. The seaward face of the peninsula is cliffs and somewhat indented; on a sandy beach in the largest of the little bays, about 2½ miles southward of Khur Ghub Ali, is Hassa Village.

Khur ash Shem (Sham) is a winding inlet, 8 miles in length, with a width in places of less than ½ mile; it is deeply indented, and contains several islands. Ras Shahath (lat. 26° 13′, long. 56° 17′), the western entrance point, 4½ miles, 121° from Ras Sheikh Masud, is a cliff about 150 feet high; 700 yards, 350° from it is a 4½-fathom patch. A small promontory, with Al Jibba Islet, 100 feet high, close off it, lies ½ mile south-southeastward of Ras Shahath, and between a cove extends southward about 1 mile, with depths of from 9 to 4 fathoms; at its head is Fanakha (Fanakhah), a little village, where there is good water.

The entrance to Khur ash Shem, southeastward of Al Jibba Islet, has a least width of 800 yards, and from 14 to 20 fathoms water; from a little distance off it is scarcely noticeable. The khur winds round the southern part of Shem Peninsula, and passes close under the precipitous cliffs of Jebel Shem. Thence to its head, the eastern and southern shores of the khur are the isthmus connecting the promontory of Ruus al Jebel with Musandam Peninsula.

On the northern side of the khur, 4 miles within the entrance, and just behind the extreme bluff of Jebel Shem, is Shem, a little village, with wells of brackish water. Ras al Hatam, a narrow point, about 50 feet high, projects ¾ mile from the northern side, 2 miles above Shem; eastward of it is Mada Village, with wells of good water.

Sibi Island, 1 mile eastward of Ras al Hatam, is ½ mile long north and south; there is no channel northward of it.

Sibi village, the largest in the khur, is on a sandy beach at the head of a deep cove in the southeastern corner of the khur, with deep water off the entrance. It has a deep well of water, which is said to be brackish after a drought. It is close to the southwestern foot of Jebel Sibi, which is conspicuous, and from seaward appears to be at the head of Khur Ghub Ali when that khur is open; it then shows a sugar-loaf top.

There are two irregular bays in the northeastern part of the khur between Mada and Sibi.

The shore between Sibi and Shem, a small island close to the southern shore, is from 200 to 500 feet high, with many little points and bights. Telegraph Islet, 600 yards southward of Shem, is 50 feet high; on it are the ruins of the telegraph station, abandoned in 1869 owing to the intense heat.

A pinnacle rock (lat. 26° 11′, long. 56° 21′), with 7½ feet water, lies 200 yards northwestward of Telegraph Islet.

Maklab Bay, southward of Telegraph Islet, is 1 mile in extent, with high steep hills on its southwestern side. Separated from the western side of Maklab Bay by a high rocky point is a sandy bight in which is Kana Village. Half-way between this village and Al Jibba Islet is the entrance to a little landlocked cove, a convenient place for laying a vessel aground, with depths decreasing from 10 fathoms. Nazifi, a small village, is on the southwestern side of its entrance.

Anchorage.—The only shoal in Khur ash Shem is the 7½-foot rock near Telegraph Islet; a sailing vessel would have great difficulty in getting in or out, but steamers can proceed up the inlet, passing northward of Shem Island and southward of Sibi. The best anchorage is southward of Telegraph Islet.

Tides.—It is high water, full and change, in Khur ash Shem at 10 h. 40 m.; springs rise 8½ feet. The tidal currents in the entrance are strong at springs.

The coast between Ras Shahath and the eastern entrance point of Khasab Bay, which is high and rocky, is indented with several little bights; in the largest is a small village with wells of good water.

Khasab Bay (lat. 26° 12, long. 56° 15′), about 2¼ miles southwestward of Ras Shahath, is about ¾ mile in extent.

Depths.—In Khasab Bay approach there are 40 fathoms ¾ mile westward of Ras Sheikh Masud, 26 fathoms 1 mile northward, and from 18 to 22 fathoms, sand and rock, eastward of it; the depth decreases quickly from less than 10 fathoms toward the shore.

The depths in Khasab Bay are 8 fathoms in the entrance, and 2 fathoms 600 yards from the beach, which dries off for nearly that distance, rendering landing unpleasant. The best landing is on the western end of the beach, and boats approaching it should keep close along the western shore.

The anchorage is open to the northward, but northerly winds are strong only in winter, when they occur very rarely and are of short duration. In summer, anchor in 7 fathoms, but, in winter, in not less than 10 fathoms; the holding ground, fine sand, is good.

Khasab town stands on a sandy beach at the head of Khasab Bay, and in a date grove, extending up the wide valley southward of the bay. At the back of the date grove, the valley is well cultivated with corn, vegetables, etc.; and the bare steep hills rising on either side are very picturesque. Little is seen from the sea, except two towers on the beach, and a fort near the middle of the grove, in which is the Shaikh's house. The Shaikh is a wali of the sultan of Maskat, who gets an annual revenue from the place. A small square tower stands on the western rocky point of the bay. The adult male population of the valley is about 600.

Supplies.—Wood, cattle, vegetables, etc., can be obtained; a cloth for wearing apparel, much used by the Arabs, is manufactured and exported.

Fresh water in good wells is plentiful, and is used to irrigate the plantations; the best well is close to the hills on the eastern side, about 400 yards from the beach.

Kada Cove (Kidah), about 1 mile westward of Khasab Bay, and separated from it by a steep ridge of hills, is narrow, and extends 1 mile southward, with depths decreasing from 10 to 3 fathoms. Kada, a small village, with a large date grove, is on the shore at its head. Makhi, a large fishing village, with wells of fairly good water, is situated on the western side, near the entrance.

Hana Cove (Hanah), about 1 mile northward of Makhi, is a small bight; here are a few huts and a fine date grove; also a well of good water about 300 yards from the beach, which is said not to fail nor to become brackish. The inhabitants are chiefly fishermen and haul their boats up in Aida Cove, a small bight about 1 mile south westward of Ras Sheikh Nasud, where also there is a well of excellent water.

Haraf village, with about 100 men, is on the mountains above Hana.

The coast from Hana trends northward 1½ miles to Ras Sheikh Masud.

Anchorage.—Good shelter can be obtained in a shamal, which here blows from west-southwest and southwest, with Ras Sheikh Masud bearing about 306° 1½ miles in from 19 to 22 fathoms water.

Ras Sheikh Masud (Shaikh Mas'ud) (lat. 26° 15′, long. 56° 13′) is often called Ras ash Shaikh. The northern extremity of the ras is cliffs about 50 feet high, and from it the land rises gradually to Fine Peak, 4,470 feet high, 9½ miles to the southward, which appears a regular cone from all directions; the long slope of the land is very noticeable from the westward. There are two little bights at the northern extremity of the ras, with white sandy beaches; in the eastern bight, on the beach, is the tomb of the Shaikh after whom the point is named.

A sailing vessel with a westerly wind should not round the ras closely or she may be becalmed under it.

Tidal currents.—The tidal currents are weak eastward of the ras, but northwestward of a line between the northern end of Jazirat al Ghanam and the ras they set southwest and northeast at a velocity of from 1½ to 2 knots.

The coast from Ras Sheikh Masud trends south-southwestward, and the cliffs increase in height and run in patches 3½ miles to Ras al Jadi, a bold cliff about 1,000 feet high and conspicuous on northeasterly or southwesterly bearings.

The coast southwestward of Ras Sheikh Masud is open to shamals, from which there is no shelter except eastward of Ras Sheikh Masud; vessels at anchor off the coast should therefore weigh on the approach of one, and stand off on the port tack.

Al Jiri, 1½ miles southward of Ras al Jadi, is a small fishing village, standing under the hills on a beach which extends southward to Bakha. Jadi village, 1½ miles south-southwestward of Al Jiri, has some wells of good water near the beach. There are date trees between Jadi and Bakha.

Bakha village (Bakhah), 1½ miles south-southwestward of Jadi village, lies on the south shore of a small bight, the western point of which slightly projects. The bight is open to the northward, and is shallow; there is a depth of 10 fathoms about 1¾ miles northwestward of the bight, seaward of which the water appears to deepen suddenly to 26 and 28 fathoms, and to 40 fathoms 4 miles offshore. Bakha has three forts: One in ruins, a square fort on a hillock ½ mile eastward of the town, and one, with a higher tower at one of the angles, on the western point of the bight; inland is a plain, with cultivation and date groves. The inhabitants are chiefly fishermen.

The coast from Bakha trends south-southwestward 6½ miles to Ras ash Shuam; it is rocky, with little sand beaches, and deep water close to. Fine Peak is nearly 4 miles inland. Fudar, Ghamtha, and Tibba (Tibat) villages, which are inhabited by fishermen and have a few date trees, are on the beaches.

Ras ash Shuam rises regularly to a mountain, about 2,500 feet high, 2 miles inland, which is conspicuous on northeasterly or southerly bearings; there is a notch in the highest part of the mountain.

Depth.—There is a depth of 31 fathoms about 4 miles, and of 25 fathoms about 2 miles off Ras ash Shuam.

The coast from Ras ash Shuam trends southward 2 miles to Shuam; it is bordered to the distance of about ¼ mile by a bank with from 2 to 3 fathoms water.

Shuam (Sha'am) (lat. 26° 1′, long. 56° 5′) is the first town on the low sandy coast, there being a plain from 1 to 1½ miles wide between it and the mountains, partly cultivated with date groves, vegetables, etc., and with wells of good water; the inhabitants are cultivators and fishermen.

The coast from Shuam trends south-southwestward 8½ miles to a khur, on the shore of which is Rams; it is low, but the land in the background is high. A bank with from 2 to 3 fathoms water extends from about 400 yards to 1 mile off it.

There is a small tower on a hillock about 50 feet high 1 mile southward of Shuam; it appears from the southward like a small peaked hill.

About 4 miles southward of Shuam is a creek used by boats at high water.

Depths.—The depths begin to decrease to the southwestward of Ras ash Shuam; there are 10 fathoms ½ mile, and 20 fathoms 3 miles offshore near Shuam. The bottom is generally sand.

Rams is a fort and small town in a date grove; its position is indicated from seaward by a tower, showing above the trees; it is built on the southern side of a khur, the entrance to which nearly dries. Zai, a small hill fort, about 2 miles east-northeastward from the town, does not show well against the hills; it is of dark color, with a square tower at each end.

About 1½ miles southward of Rams is a small creek, communicating with Khaima Khur. The date groves are a little distance from the shore, which is swampy, but they extend far inland and continue southward and along the eastern bank of Khaima Khur.

Ras al Khaima (Khaimah) (lat. 25° 48′, long. 55° 57′) is a low sand spit, extending 3½ miles northeastward, on which stands Khaima Town, the seat of the deputy governor of the district of the same name, who is subordinate to and responsible to the Shaikh of Sharja, the present head of the Jowasim tribe, to which both places appertain. The Shaikh has also authority in that part of the east coast of Oman called Ash Shameiliya.

The town, which may contain a population from 4,000 to 5,000, is built chiefly of stone; some square buildings higher than the rest

are the Shaikh's residences; on one corner of the highest is a little dome about 60 feet high; the flag of the Jowasim (red with a narrow white border) is flown from a high building to the northward.

A white round tower stands at the northern end, and a fort with two square towers on the wall built across the peninsula at the southern end of the town, where there is a large and conspicuous tree. A detached tower stands 800 yards southwestward of the fort, and another 1 mile further southwestward, near the commencement of some red sandhills. There is also a circular white tower on the summit of the 80-foot hills, and about 2 miles southward of the fort.

The plain here is only about 6 miles wide, and its width increases rapidly to the southward, as the coast turns southwestward, so that from the northward the town appears to be at the point where the mountains end.

A range of reddish sandhills, about 130 feet high, begin a mile southwestward of Khaima and extend past Al Hamra; from the westward their northern end is a guide.

Depths.—The coast in the vicinity of Ras al Khaima is bordered by a bank, with less than 3 fathoms water, extending from 1½ to 2 miles offshore, and the 5-fathom curve is about 2½ to 4 miles offshore, but there are patches of 3 fathoms in places between the 3 and 5 fathom curves. Caution is necessary in the approach on account of these shoals. There is a depth of 13 fathoms about 8½ miles offshore.

Shoal.—A sand knoll, with less than 6 feet water, lies ¾ mile offshore with the fort bearing 119°.

Anchorage.—A good berth is in 5½ fathoms, with the fort bearing 138° 3.3 miles. Small vessels anchor in 4¼ fathoms, with the fort bearing 123° about 1.9 miles. The holding ground is good, and the natives say there is not so much sea in a shamal here as at other places in the locality.

Khur.—The entrance to the khur or backwater is round the low sandy point of Ras al Khaima, 2½ miles northeastward of the town; large unladen boats enter at high water; it runs down close to the back of the town, where the native boats lie; there is a depth of 2 feet in the entrance, but inside 9 feet as far as the town. There are two low islets in the backwater opposite the town, on one of which is a small fishing village.

A great many boats and bagalas belong to this port, and the people are civil to Europeans. The inhabitants send about 20 boats to the pearl fishery.

Tides and tidal currents.—It is high water, full and change. at Ras al Khaima at 11 h. 45 m.; springs rise 7 feet. The tidal currents between Ras al Khaima and Jezirat Tanb set strongly northeastward and southwestward.

Near Ras al Khaima the current sets to the northeastward when the tide is flooding at Maskat and to the southwestward when it is ebbing.

Supplies of cattle, vegetables, and fruit can be obtained at Khaima; water uncertain.

The coast from Ras al Khaima trends southwestward 120 miles to Abu Thabi (lat. 24° 29′, long. 54° 42′) and is low sand throughout. The mountains of the Ruus al Jebel promontory are visible in clear weather until past Dibai; but this coast is remarkable for the high degree of refraction or mirage frequently experienced, especially in the early morning, when the coast features become greatly distorted, villages sometimes appearing as clumps of rounded trees, and small uncharted hillocks or dunes as hills of considerable height.

The towns are all very similar in appearance and are situated near the entrances to khurs or salt water creeks, of which there are many along the coast, often communicating with each other or forming large backwaters, in which the native vessels lie. Everything connected with these places seems to indicate a state of decay.

The similarity of appearance makes it difficult to distinguish one town from another; on this account a somewhat detailed description of any peculiarity in the appearance of each is given.

Supplies.—Cattle, vegetables, etc., can be obtained everywhere; the beef is often very good, and much better than the mutton. Capital mullet are caught in all the backwaters, and fish is generally plentiful. Water is scarce and indifferent, especially southward of Dibai; it is generally obtained from shallow wells dug in the sand.

Reefs.—The coast between Ras al Khaima (lat. 25° 48′, long. 55° 57′) and Umm al Kaiwain, 24½ miles southwestward, has not been thoroughly examined, but the 5-fathom curve is from about 2 to 5 miles offshore, and in places within this line there are patches with 2½ and 3 fathoms water. Between Umm al Kaiwain and Ras Hanyura, 71 miles farther southwestward, the coast is cleaner, but thence to Abu Thabi, a distance of 22 miles, it is fronted by reefs extending 5½ miles offshore.

Anchorage off the coast is open between northeast, through northwest, to southwest, and the holding ground is often hard and bad. On the approach of a winter shamal, a vessel should weigh and stand off on the port tack, as that wind blows from about west-northwest, or even more westward. Anchor farther offshore in winter than in summer, and furl sails with reefs in.

Tidal currents.—It is high water, full and change, on the coast about 12 h., and the tidal currents, off the coast, are said to set southwestward from about four to three hours before until two to three hours after high water and northeastward from about two to three

hours after high water until four to three hours before the next high water, at a rate of from 1 to 2 knots.

The Great Pearl Bank includes the whole space on the Arabian side of the Persian Gulf southward and southwestward of the 20-fathom curve, commencing northwestward of Sharja.

The coast between Ras al Khaima and Jazirat al Hamra, 10 miles southwestward, is a slight and shallow bay.

Jazirat al Hamra (lat. 25° 43′, long. 55° 48′) is a fort and town on an island, between which and the mainland is a khur. The fort has several towers and there are a few round trees in it; close-to is a high, square tower with two rows of windows, and there is a high, slender tower at the western end of the town. The inhabitants are of Al Zaab tribe, and the place is under the Shaikh of Sharja, the Jowasim chief.

There are no date groves here, but there is one conspicuous palm near a tower at the eastern end of the town. The range of reddish sand hills terminates about 3 miles southward of this place. There are 10 fathoms water 4 miles off the town and 3 fathoms ½ mile; the bottom is generally sand.

Khur.—The entrance to the khur is round Ras Abu Ahmad, a low, sandy point ¾ mile northeastward of the town; thence the khur runs southwestward between the town and the strip of sand forming the beach and is shallow opposite the dwellings; it has depths of 2 to 3 feet in the entrance and from 7 to 8 feet inside.

The coast from Jazirat al Hamra trends southwestward 14 miles to Umm al Kaiwain Point. A reef, nearly dry in places, and said to be growing out, extends ½ mile to 1 mile off-shore from about 1 mile southward of Al Hamra to Umm al Kaiwain Point; 5 miles northeastward of the point the 5-fathom curve is nearly 3 miles off-shore, with a depth of 2 fathoms a little inside it. The reef shows well by day. There are 10 fathoms from 2 to 4½ miles seaward of the reef, the depth decreasing gradually to from 4 to 2 fathoms close to it.

Khur al Baiza (Baidah), the entrance to which is 7 miles southwestward of Jazirat al Hamra, communicates with Umm-al-Kaiwain Khur, but is only navigable by small boats. On the seaward side of the island, which is northwestward of and separated from the mainland by the khur, and 3¼ miles from Umm-al-Kaiwain Point, is a small fort with a double tower and a date grove westward of it.

Umm-al-Kaiwain Point is low sand with a rocky beach, and about 1½ miles southward of it is a date grove. From the point the coast trends eastward nearly 1 mile to the khur, which turns southward and westward, forming the peninsula on which the town stands. A reef of sand and rocks extends northward from the western side of the entrance of the khur.

Anchorage.—Anchor in 5 to 6 fathoms with the high flagstaff tower on the point about 164° (if it can be distinguished), but in winter farther out, in 8 fathoms.

Depths.—There are 10 fathoms 4 miles northwestward of Umm-al-Kaiwain point, decreasing regularly to 5 fathoms 1 mile from the shore; northward and northeastward of the point the 5-fathom curve is 2½ miles from the beach. The depth decreases quickly from 5 to 3 and 2 fathoms in this locality.

Umm-al-Kaiwain (lat. 25° 35′, long. 55° 35′), an independent thriving town, inhabited by Al Ali tribe, probably consisting of 800 men, is tolerably clean and well built, and sends a large number of boats to the pearl fishery. A few Banyans are settled here, who carry on most of the trade. From about 10 miles off, its six or eight detached towers appear to stand in the sea; one, with a flagstaff, is much higher and larger than the rest, and shows like a boat, when the others are below the horizon. This tower, which was partially destroyed by a bombardment of the place in 1914, has been repaired, and two others stand on the point, and form part of a wall built across the isthmus. The Sheik's fort is in the middle of the town.

Anchorage.—There is anchorage in 5 fathoms, with the large tower on the point bearing 197°, about 1 mile. Landing is bad, except in fine weather, except within the reef, which has a depth of 3 feet over it in places.

The entrance to the khur, 2 miles north-northeastward of the point, has 2 feet water, and a fringing reef on its eastern side. A tower about ¼ mile eastward of the town stands on its western bank, and the entrance to the backwater is marked by a ruined mosque with a round kiln-shaped tower close to it.

At the town, the khur is about 600 yards wide, and carries a depth of from 6 to 8 fathoms; it here divides into several branches, the main one trending southward. There are 3 fathoms behind the town, where the boats lie. The khur is an extensive backwater, with several low islets.

The coast from Umm-al-Kaiwain trends south-southwestward 7 miles to Al Hamriya, and thence 5 miles to Al Ajman fort; the depth continues regular with rocky bottom; there are 5 to 6 fathoms about 1 mile offshore until about 2 miles from Al Ajman. Do not bring up near the shore, where there is a liability of losing the anchor.

Al Hamriya (Hamríyah) is a small place, with a population of about 400, under a local Shaikh of the Na'im tribe, who looks for protection to whichever of his neighbors among the Trucial Shaikhs is most able and willing to afford it; it sends 50 boats to the pearl fishery. It has a square fort on the shore, with five towers in a cluster, which can be seen from a distance of about 11 miles; there are

also two detached towers farther southward near a small creek, and a large date grove near the northeastern end of the village. The people are very poor.

Al Ajman Fort ('Ajman) is also under a Shaikh of the Na'im tribe. The fort is small and high; one of the towers, from which the flag is flown, is much higher than the rest, and can be seen from a distance of about 12 miles.

The water is bad, and obtained from wells a mile southwestward of the town. Al Ajman sends 60 boats to the pearl fishery.

Depths.—A bank, with 2 to 3 fathoms water, extends 1¼ miles off Al Ajman, and there are depths of 5 fathoms 2¾ miles northwestward of the fort. A depth of 3½ fathoms has been obtained 2 miles, 5° from the fort, and also less water than charted to the northwest of this position; the soundings were irregular. The locality should not be approached to less than 10 fathoms, about 4 miles off shore at night. The bottom is rocky, and bad anchorage ground.

The khur is the easiest of access of any on this coast, and is used by very large boats. The entrance is close to the northern end of the town, between two spits of sand extending ¼ mile from the shore; the bar, which is sand, has 2 feet water. Within the bar are two khurs, one trending southwestward to Al Ajman, and Zora khur, the other, northeastward. A channel, with from 6 to 9 feet water, extends ½ mile close along the northwestern shore of Zora khur, which then opens into drying lagoons.

There are 2 fathoms water in the khur off the town; the channel is near the town side, a bank extending halfway across from the northeastern law sandy entrance point.

The coast from Al Ajman trends southwestward nearly 5 miles to Sharja; the 3-fathom curve is from ½ to 1 mile off it.

Al Haira (Hairah) and Fasht are two small villages on the shore ¼ mile apart, and 3 miles from Al Ajman; Al Haira, the northern, has two detached towers, and Fasht a large fort and several towers. The khur here is very small. Between Al Ajman and the villages, in rear of the towers, is a clear uncultivated space about 2 miles in extent. The villages are dependencies of and almost joined to Sharja, and together send about 30 boats to the pearl fishery.

Sharja (Sharjah) (lat. 25° 22′, long. 55° 24′), the most important town on this coast, has a population from 8,000 to 10,000, chiefly of Al Jowasim tribe, under the Shaikh of Sharja, the present head. The town extends about 1¼ miles along the eastern bank of a khur, and in it are several detached towers of unequal height; the flag is flown from the northern tower of the fort. Northward of the flagstaff tower is the Shaikh's house, a large white two-storied building.

Sharja has a large proportion of stone houses, and there is a high tower at the southern end of Liyah Village, which is situated on the

southern part of Liyah Point, a small projecting point westward of, and separated from Sharja by the khur, and there are also many square buildings between the town and that village, which from the sea appear to be part of Sharja, as do the villages northward of the town. At the southern end of Sharja, some white rocky rising ground, from 30 to 40 feet high, ends in a bluff at its southern extremity; this is somewhat conspicuous from the northward; a small dark rocky point between the fort and Liyah is in range with the bluff when bearing about 167°. Between Sharja and Khan village, 2 miles to the southward, there is a clear space of about 1 mile without any trees, which is noticeable. The beach is of white sand, the rocky point and bluff being both dark.

Sharja sends about 350 boats to the pearl fishery. Several bagalas belong to the port, and very fine boats, bakaras and batils, are built here. Many Banyans are settled in the place.

Depths.—About 4 miles off the town there are depths of 10 fathoms, which decrease fairly regularly to 5 fathoms 1 mile from Liyah Point. The 20-fathom curve is 25 miles from the shore.

Anchorage.—For the sea breeze to be a leading wind for boats to and from Liyah Point, anchor with that point bearing from 180° to 160°, in summer in 5 fathoms, and in winter in 7 fathoms; the holding ground is bad, being rock covered with a little sand.

Landing.—The best place for boats to land is at Liyah Point, and not at the khur, where there is generally a surf. A boat should pull around the point, and then bring it to bear about 340°; this place affords the only safe landing in even a moderate shamal. There are many ferryboats in the khur, which in landing here, has to be crossed to reach Sharja town.

The khur is very small and shallow, its entrance being 1 mile northeastward of the flagstaff tower; it trends southwestward between the town and a narrow strip of sand to seaward; winding round the little bluff before mentioned, it spreads out into a small backwater, and joins the khur from Khan Village. There is only 1 foot water on the bar, but large unladen bagalas, &c., enter.

Supplies.—Provisions can be obtained, but the price is rather high. All supplies have to be purchased in the bazaar.

Liyah Village is a large suburb of Sharja, and is entirely mat huts; the large tower at its southern end is ¼ mile from the point.

The coast from Liyah Point (lat. 25° 22′, long. 55° 23′) trends southwestward, 7¼ miles, to the western point of Dibai Khur. A little khur lies 2¼ miles southwestward of Liyah Point, with Khan Village on its northern, and Abu Hail Village on its southern side. They are dependencies of Sharja, and are noticeable from seaward. The country is low and swampy for some miles inland.

Khan (Khán) is nearly all mat huts, and has five detached towers; it has a population of about 1,000, and sends 25 boats to the pearl fishery. The khur divides into two branches; one turning northeastward joins Sharja backwater, the other trends southward behind Abu Hail Village (lat 25° 20′, long. 55° 22′).

Abu Hail (Háil) is also almost entirely mat huts, and has four towers, which are nearly in range when bearing 137°; at its southern end is a wall built across from the sea to the backwater; it has a population of about 2,000, and sends 40 boats to the pearl fishery. The towers, as well as those of Khan, look high in proportion to the size of the houses, and are easily distinguished. There is a depth of 5 fathoms 1 mile offshore at these villages, but the ground is bad for anchorage.

There are date trees between this and Dibai, and the coast is white sand. Northward of Dibai there is a space clear of trees, with a large round tower having two small buildings at its base; on southerly and southeasterly bearings the tower is conspicuous, appearing like a lighthouse with its attached buildings.

Reef.—A flat stony reef, with 6 feet water, extends ½ mile off the coast for some distance northeastward of Dibai, and about 600 yards off the western point of Dibai Khur.

Dibai (Dabai) is a town, with its suburb Dairah, with a population of about 6,000 of the Abu Felasa tribe, a branch of the Bani Yas; it is under an independent chief; there are also a few Hindus here. The town is a little inland, and a date grove behind it extends a mile southward, and ends in a detached clump. The large suburb of Dairah, entirely mat huts, stands on the eastern entrance point of the khur northeastward of the town. The highest building in Dibai is the fort, a high square castle, with a tall round tower at its southwestern corner, from which the flag is flown; there are eight or nine smaller towers in the town and northward of Dairah.

Dibai sends about 150 boats to the pearl fishery; they are employed in other fisheries during winter.

Anchor off Dibai in 5 fathoms, with the fort bearing 160° about 1,800 yards from the shore, or in a small vessel in about 4 fathoms, with the fort bearing 156°, ¾ mile from the shore, but the holding ground is bad. A British naval vessel anchored here in March, 1911, when, with a westerly wind of force 4, the sea rose considerably in three hours, and the ship dragged both anchors, and had to weigh. The 5-fathom curve is about 1¼ miles offshore northward of Dibai, and ½ mile westward of it. Do not anchor in less than 4 fathoms; there is a good berth in 6 fathoms, about 1 mile off. The anchorage affords no shelter from a shamál.

Dibai Khur.—The western low sandy entrance point (lat. 25° 16′, long. 55° 18′) of Dibai Khur is ½ mile northwest of the town; it has

of late years somewhat extended, and projects slightly. The entrance has 2 feet water, with rocky bottom in places, and is much obstructed by the reef; the channel winds southward close past the outer entrance point; a spit extends off Dairah Point, which is 600 yards southward of the opposite side of the entrance. The khur then turns eastward between the town and Dairah Point, where it is 150 yards wide, with from 4 to 5 fathoms water. It extends several miles southeastward, but, beyond the town, is only used by fishermen.

Communication.—In normal times the vessels of the British India Steam Navigation Co.'s subsidiary mail service call at Dibai fortnightly, on their passages to and from Bombay.

The coast from Dibai trends southwestward 70 miles to Abu Thabi; excepting a small village with date trees, about 4 miles southwestward of Dibai, it is quite barren, uninhabited, very low, and uniform in appearance, with tufts of coarse grass growing on the sand hillocks, intersected by creeks, and in places by extensive swamps; there is no tree larger than a mangrove bush.

Although there are no settled inhabitants, landing on the mainland between these towns, except with an armed party, is hazardous, as it is often visited by the Bedawin from the interior.

Jebel Ali ('Ali), 17 miles southwestward of Dibai, and 3 miles inland, is a flat-topped hill 220 feet high, rising gradually from each end; it is the only landmark on or near the coast.

Ras Hasa, 30 miles southwestward from Dibai, is a little rocky point, projecting slightly from the coast, and only showing when close inshore as a small dark patch on the white sand. There are regular soundings of 3 fathoms, fine sand, 1,600 yards off-shore, between Dibai and the ras, deepening gradually to seaward. Ras Kantut, a similar point, is about 5 miles farther southwestward.

Ghanatha and Ghurabi, 3 and 5 miles, respectively, southwestward of Ras Kantut, are two khurs where mangroves are cut for firewood. Ghanatha (Al Ghanadhah) is marked by the mangrove bushes at the entrance; it is the larger of the two, and is said to be easily entered by large boats.

Between Ghurabi and Abu Thabi, there is a succession of khurs, mostly communicating with each other, with merely a small strip of sand seaward of them. Some of these khurs have deep water within, though their entrances are very shallow, and the whole form extensive swamps and backwaters extending many miles inland. They are visited by Arabs for firewood and for fishing purposes.

Ras Hanyura (lat. 24° 44′, long. 54° 38′) is the northern low sandy point of a shallow bay 3 miles wide, into which many khurs open; Maraifjain is the southern low sandy point. These points can be seen from a distance of about 5 miles. A small cliff, with a

slightly overhanging top, at the head of Hanyura Bay, and at the southern end of a little tableland 20 to 30 feet high, can be seen from a distance of about 7 miles, and is a mark for the bay.

The coast from Ras Hanyura trends southwestward 24 miles to a point about 2½ miles southwestward of Abu Thabi fort, and is fronted by the Hadd al Thalei, an extensive reef which, commencing near Ras Hasa, extends 1½ miles off Ras Hanyura. Its outer edge then trends west-southwestward 8 miles, when it is probably 5 miles from the land, and then turns south-southwestward, joining the reef off Abu Thabi. There is a depth of from 5 to 6 fathoms close off the reef, and the lead is not a good guide when approaching it, as the depths are irregular. The natives say there is a boat channel inside the reef, which is used by them during shamals.

Ras al Ghurab, 9½ miles southwestward of Ras Hanyura, is a rocky point with low sandhills; here the reef extends 3 miles offshore. There is a khur at this point, said to be extensive, with deep water inside and more water in the entrance than in any other on the coast.

Ras Laffan, 3 miles northeastward of Abu Thabi, is a low point on the northern side of the entrance to a khur which leads southward and joins the great backwater southward of Abu Thabi; bagalas belonging to Abu Thabi are hauled up in this khur.

Abu Thabi (Abu Dhabi), standing at the western extremities of the country of Oman, is the principal town of the great Bani Yas tribe, and is under an independent Shaikh, who claims the sovereignty over the coast westward to Khur al Odaid. His authority is nominally recognized also by the Bedawin of these parts. The Bani Yas are a fine race of men, and the Shaikh is very friendly to the British. They wear their hair long over the shoulders, twisted up in plaits. Abu Thabi (lat. 24° 29′, long. 54° 21) was formerly the chief seat of piracy in these waters.

The fort is small, with six towers close together, on one of which is the flagstaff. A small tower stands on the beach, where there are also several conspicuous stone buildings, one of which is on the low northwestern sandy point of the town; the rest of the town, extending nearly 2 miles along the shore, is date mat huts. It has a population of about 20,000, with some Banyans amongst them, and it sends 600 boats to the pearl fishery. After the pearl season the fishing boats are to be found at every island, creek, etc., between Abu Thabi and Khur al Odaid.

There are few stunted date trees, about 1 mile inland of the town.

The coast is very low white sand, the only landmarks being the fort and Jebel Fataisa, a low hill on an island in the backwater, 6 miles southward of the fort. This hill, from seaward, first appears

of a dark color, but on approach the white sand of the lower part becomes visible.

Reef.—A reef, 300 yards broad, extends 700 yards west-southwestward from about 300 yards northwestward of the northwestern sandy point of the town; it has from 3 feet to 1 fathom water, and a bank, with from 1½ to 3 fathoms water, extends 1¼ miles northward and northwestward. The channel between the reef and the shore has a least depth of 2 fathoms.

Anchorage.—Large vessels anchor in from 4 to 5 fathoms water, with Abu Thabi fort bearing 122° distant about 2 to 2½ miles; this position is open to seaward. Small vessels of 12 feet and less draft anchor in the channel between the reef and the shore, in about 2½ fathoms water, with the fort bearing 174°, ¼ mile offshore; this anchorage is quite sheltered by the reef.

The holding ground is bad, consisting of coral, bare in places, in others covered with soft sand.

The inner anchorage is generally fully occupied by native craft.

Tides.—It is high water, full and change, at Abu Thabi at about 12 h., rise 6 to 8 feet.

Directions.—For Abu Thabi from the northward make Sir Abu Nu Air; bring and keep its peak bearing 356° and continue to steer 176° after losing sight of the island. The soundings are irregular, varying from about 16 to 7 fathoms, and there are great overfalls; the tidal currents which set, probably about 1 knot, northeast and southwest, must be considered. Keep a good lookout from aloft, as the fort is only visible from a distance of about 8 miles from deck, or when in 8 fathoms water, which depth is also found close to the reefs. The reefs northeastward of Abu Thabi must be especially guarded against. Having made Abu Thabi Fort, bring it to bear 122°, and anchor as above directed.

For the inner anchorage, to enter which the afternoon is the best time, approach with the fort (lat. 24° 29′, long. 54° 22′) bearing 122°, and pass close southwestward of the reef, which shows well; then turn eastward and northward close round the reef, and anchor as above directed.

In approaching Abu Thabi from the northeastward, give a wide berth to Hadd at Thalei.

There is a passage northward from the inner anchorage, which appears to have a depth of 2 fathoms; it is available for a sailing vessel leaving the anchorage with a westerly wind, the vessel being conned from aloft by sight. The passage is used by native craft.

Caution.—Attention must be paid to the lead when approaching the southern shore of the gulf, as the currents are strong and uncertain, the land very low with few or no distinctive features, and the survey is very incomplete.

Supplies.—Cattle might possibly be obtained at Abu Thabi. The water here is very brackish, all good water being brought from Dibai.

Pilots.—The best pilots for the coast between Dibai and Al Bida can be obtained at Abu Thabi.

The khur.—About 3 miles southwestward of Abu Thabi Fort is the mouth of a channel leading into a large backwater, 3½ miles wide in the entrance, and extending possibly 20 miles inland. The greater part is shallow, but there are many deep channels and several islands; it has not been sounded. By its connection with Khur Laffan, to the northward, the land on which Abu Thabi town stands becomes an island; there is, however, one place fordable at low water.

Sir Abu Nu Air Island, (Sír Bu Na'air), 45 miles, 351° from Abu Thabi, is about 2¾ miles long northwest and southeast, and 2 miles broad; it is hilly, chiefly small volcanic hills except the southeastern extremity, which is a very low sandy point, ½ mile long. The highest point of the island is a table-topped peak, 240 feet high, near the southern end of the hills, and rather conspicuous except from the northward.

The island is bordered by a reef extending from 400 to 600 yards. The southeastern point, being low, must be given a good berth at night. The soundings are not a good guide in approaching the island, there being from 10 to 15 fathoms close to the surrounding reef, and also the same depth several miles distant; about 35 miles northwestward of the island, and near the edge of the Pearl Bank, are great overfalls.

The island (lat. 25° 14′, long. 54° 13′) belongs to the principality of Sharja, but is uninhabited. There are a few wild cats and a fair number of sea birds, as well as some curlew. It is barren, nothing except brushwood growing on it. There is brackish water in wells near the eastern side, and there is a deep well of good drinking water, with tracks leading to it from the southeast point, but it is too hard for washing purposes; iron ore and some sulphur are said to exist.

During the pearl fishery the island is visited by fleets of boats, to open the oysters, etc.; and in winter there are generally a few Sharja or Dibai fishing boats here; their crews, with their families, erect temporary huts and remain some months fishing, chiefly for sawfish and sharks.

Anchorage.—There is anchorage on the eastern side of the island in 13 fathoms, about ½ mile offshore, with the peak bearing 275° and the southeastern point 202°, sheltered from the shamal, but open to the nashi.

CHAPTER V.

PERSIAN GULF, SOUTHERN PART.

ABU THABI TO RAS RAKKIN.

(Lat. 24° 29′, long. 54° 22′, to lat. 26° 11′, long. 51° 13′.)

The southern shore of the Persian Gulf is low and sandy, or stony, with here and there rocky hills, or sand hills, of moderate height. It is entirely barren and desolate; water is only obtainable at a few places, and even then is of very indifferent quality. From Abu Thabi to Al Wakra, 157 miles west-northwestward, and about 60 miles southward of Ras Rakkin, there are neither villages, houses, nor permanent inhabitants. The shore is occasionally visited by the Bedawin of the Bani Yas, Bani Hajir, and Manasir Tribes, any of whom might attack a small unarmed party, but is seldom or never visited by Europeans, except from Ras Rakkin to Al Wakra, where a British naval vessel occasionally calls; even the Arabs rarely land here.

Reefs.—Great reefs extend for some 45 miles offshore, sometimes with open water or channels inside them. The reefs generally have from 3 feet to 3 fathoms water, with stony or broken coral bottom; they show well except on cloudy days or when under the sun. The water is comparatively shoal everywhere, with great overfalls in places, so that when near or within the great reefs, it is not safe to be under way after dark, the eye being the only guide; a good look-out from aloft is indispensable. The water is everywhere very clear.

Great Pearl Bank.—The 20-fathom curve, within which nearly all the overfalls are found and which may be considered the edge of the Great Pearl Bank, trends from about 20 miles northward of Sir Abu Nu air to Halul Island (lat. 25° 40′, long. 52° 25′), and thence northwestward to about 30 miles northeastward of Ras Rakkin. To the southward of this curve are nearly all the numerous pearl banks known to the Arabs. On the Great Pearl Bank the depths average from 10 to 15 fathoms, but there are deep places with from 20 to 23 fathoms, and many shoal knolls with from 3 to 9 fathoms, which latter are the Pearl Banks proper.

Islands.—Many islands lie off the shore; some are high, and most of them have a projecting, low, sandy southeastern point. They are

barren and without fresh water, though a little very brackish water may be found on one or two of them. Dalma excepted, none have permanent inhabitants, but they are frequented by the pearl boats during summer, and in winter by Abu Thabi fishermen, who bring their families and make a stay of from two to three months. They take turtle, which abound on the reefs, for the sake of their oil, and also catch and dry fish for food.

Pilotage.—A vessel visiting the coast, or navigating within the reefs, should have an Abu Thabi pilot on board.

The coast from Abu Thabi to Jazirat Sir Beni Yas, about 93 miles to the westward, is seldom approached and is very little known. Reefs lie from 10 to 30 miles off it, with many low islands on them, some of considerable size and overgrown with mangroves. There are numerous creeks and backwaters in the eastern part, and channels through and between the reefs, which are only partially explored. The land is a stony desert, with small detached groups of volcanic hills and low cliffs on the coast.

The coast from Abu Thabi trends southwestward 30 miles, with a reef extending 3 miles off Jazirat al Bahrani, and 8 miles near the entrance to Khur Kantur (lat. 24° 19′, long. 53° 59′). The apparent coast line is a number of low islets, with creeks running in and meeting behind them, thus detaching them from the mainland proper, which is some considerable distance within, and has not been explored.

Many of the islets and the mainland behind them are resorted to by the Arabs to cut mangroves for firewood, and the creeks are visited by fishermen. All the creeks are said to be shoal at the entrance, with deeper water inside.

Tides.—The tides appear to be regular; the progress of the tidal wave is much retarded in the shoal water, and is several hours later near Khur al Odaid than at Abu Thabi, but observations have not been made on the tidal hours. The rise at Sir Beni Yas is about 8 feet. The currents are strong in places, round the points of islands, through narrow channels and between reefs.

Jazirat al Bahrani, on the southwestern side of Abu Thabi backwater, is about 5 miles long northeast and southwest, and low sand, with some mangroves.

Jebel Abu Kashasha is a small hill on the island next southwestward of Al Bahrani; it is used as a landmark by the Arabs.

Ras al Kahaf, between Jebel Abu Kashasha and Jazirat Umm al Majarib, 7 miles southwestward, is a flat-topped rocky point, comparatively high and probably a projection of the mainland.

Khur Kantur, 22 miles west-southwestward of Abu Thabi, is a channel through the reef, 1 mile wide at the entrance, extending southward 8 miles, where it bifurcates, one branch flowing eastward

behind Jazirat Kantur, the other westward behind Jazirat Salali. There are 2 fathoms water in the entrance, and 4 fathoms farther in. Following the eastern branch, beyond Jazirat Kantur, and separated from it by a small creek, is Jazirat Umm al Majarib; these two islands are several miles in extent, low, and with a growth of mangroves.

Jazirat Salali, on the western side of Khur Kantur, is 7 miles long, east and west, and low, except a hill near its northeastern end. Boats use the channel westward of the island and get into Khur al Bazim at high water.

Bazim Reef, commencing on the western side of Khur Kantur, extends 53 miles westward. The whole northern edge of the reef, on which is Halat Hail Islet, is only charted approximately, and the lead is no guide in approaching it, there being from 5 to 10 fathoms close-to, and similar depths 15 miles from it. A chain of islands, called generally Bazim (Bazam) by the Arabs, though each island has its own particular name, stretches along its southern edge.

Rak al Hajji.—Halat al Mubarraz, about 53 miles westward of Abu Thabi, and on the southern edge of Rak al Hajji, is a low narrow sand islet, without any vegetation, about ½ mile long, north and south, and 3 feet high. The space southward of Rak az Zakum, between Abu Thabi and Halat al Mubarraz, is imperfectly sounded; there are great overfalls in places. Rak al Hajji has not been surveyed, but is probably about 9 miles long, east and west, and 7 miles broad; there are one or two sandbanks on it, which dry. Khur Bashubar, the channel between Rak al Hajji and the Bazim Reef, is about 1½ miles wide, with from 4 to 8 fathoms water; the tidal currents, setting east and west through it, are strong at springs.

Halat Hail (Háil), an islet, lies near the northeastern extremity of the northern part of Bazim Reef, and 3½ miles southeastward of Halat al Mubarraz, to which it is similar, but larger. There is a depth of 2¼ fathoms about 2 miles northeastward of the islet.

Rak az Zakum (lat. 24° 48′, long. 53° 46′) is a large pearl bank, of which the shoalest part, 3 fathoms, is 38 miles 302° from Abu Thabi. Its extent is not accurately known, and the soundings around are but little guide to approach it. There is a clear channel about 18 miles wide between it and Rak al Hajji to the southwestward.

Bu Tini, the center of which is about 19 miles west-northwestward of Halat al Mubarraz, is a shoal about 9 miles in extent in all directions; there are about six dry sand banks on the shoal, which in places is nearly dry for miles. On this and on many other shoals, the fishermen walk about knee deep in water, looking for pearl oysters far from their boats.

Khur Halj is the clear channel between Bu Tini, on the north, and Rak al Hajji and Reideim, the northwestern portion of Bazim

Reef, on the east and south; it appears to have a least width of about 5 miles, with depths of from 5 to 8 fathoms.

Directions.—Khur Halj is navigable by day in clear weather. The dry banks on Bu Tini can be seen from aloft some distance from the shoal, and Bazim al Gharbi, the western island on Bazim Reef, is also visible from aloft when in mid-channel.

To pass eastward through the khur, keep on the Bu Tini side, with the sand banks of that shoal in sight until past it, and keep a good lookout for the pale green water of Rak al Hajji. To pass through Khur Bashubar, from Bu Tini Reef, steer, with caution, toward Rak al Hajji, and, having made it, run along its edge and pass ¼ mile southward of Halat al Mubarraz.

These passages should only be used with the sun astern of the vessel.

Khur al Bazim (Bazam) is a large inlet or blind channel lying between the Bazim Reef and the mainland. It extends east-southeastward about 50 miles, and its width, which is 6 miles at the entrance, decreases to 1 mile at the head. The khur has been fairly surveyed, except the entrance, which is unsounded.

A large vessel should not use Khur al Bazim for navigation, nor approach Sir Beni Yas from the eastward, though, with a good lookout, a vessel of light draft can enter the khur.

The entrance (lat. 24° 22′, long. 52° 58′) is about 6 miles wide between the western part of Bazim Reef and the reef extending off Al Isha, but there are some outlying shoal patches. The depths in the khur decrease from 10 fathoms at the entrance toward the head, and are somewhat irregular.

Bazim al Gharbi is a low island about 2 miles in extent, partly covered with mangroves; it is the western of the group on Bazim Reef, and about 3 miles from the western end of the reef; Reideim, the northwestern portion of the reef, extending 7 miles northward from the islet, is probably detached.

Wood.—Green mangrove wood for fuel might be obtained here, also on the otner islands of Bazim Reef, a vessel's crew cutting it. The islands are all without water.

Al Isha, 10 miles westward of Bazim al Gharbi, is a low sand islet, lying on a reef which extends 8 miles northward from the islet; there are several dry sandbanks on the reef, of which Ras Burud is the northeastern point.

Directions—Anchorage.—To enter Khur al Bazim from the northward, bring Zirkuh Peak, when distant over 5 miles, to bear 24°; keep it so astern, which leads westward of Bu Tini. When the sandbanks on Bu Tini, which should be seen, are all passed, steer about 176°, allowing for the tidal currents, and look out for shoal patches. Al Isha should be sighted, and when it bears about 270°,

steer about 102°, looking out for the southwestern point of Bazim Reef. When the southeastern point of Bazim al Gharbi bears about 69°, steer for it, and anchor 1 mile offshore in 5 fathoms, clay, good holding ground, and completely sheltered by the reef.

From this anchorage, two points of the mainland are visible; Ras as Sawami, 8 miles south-southeastward, is a light colored cliff, apparently about 50 feet high; Ras Jaliya, 10 miles southwestward, is of somewhat similar appearance, and is so named from its having an imagined resemblance to a fort. A reef extends about 6 miles off the shore between these points. The mainland coast from Ras Jaliya continues westward 22 miles to a point near which is Jebel Thanni.

In the proceeding eastward up the khur from Bazim al Gharbi, the soundings appear more regular, and the islands on Bazim Reef are left from 1 to 2 miles to the northward, being guided by the eye in approaching the reef. Al Fiha, the third island, is 6 miles long east and west; the fourth island, which is rocky, is passed close to.

Al Junaina, the next, situated on the reef 1½ miles from the khur, is also rocky, and has several detached rocks near it; Jazirat Abil Abyaz (Abul Abyadh), the eastern and largest of these islands, is about 16 miles long, east and west, and has low sandhills on its western part.

Sir Beni (Bani) Yas (Yas Island) (lat. 24° 19′, long. 52° 37′), 13 miles westward of Al Isha, is an island about 6 miles long north and south, and 4 miles broad; it rises in the middle to volcanic hills, and the two highest peaks are 430 feet high and close together. The coast of the island is low, except near a small hill, about 70 feet high, on the eastern side.

Bad water can be obtained by digging on the northeastern side, near a ruined village close to the shore.

Meriton Bay is a landlocked harbor in the southeastern part of Sir Beni Yas; it is ½ mile in extent, with 4 fathoms water in its entrance, and 6 fathoms, mud, inside; the entrance is 400 yards wide.

Rashid (lat. 24° 25′, long. 52° 40′), 4 miles north-northeastward of Sir Beni Yas, with a channel 1½ miles wide, having from 18 to 7 fathoms water, between, is an island ¾ mile long northwest and southeast, low, flat, and rocky. From Al Isha to Rashid the shoals, if not continuous, have no navigable passage through them.

There are great overfalls northward and northwestward of Rashid.

Channels through the reefs—Directions.—For Meriton Bay, from the northward, after sighting Sir Beni Yas Island, bring it to bear 180° and steer for it until Rashid is seen, and pass within 1 mile westward of that island to avoid the reef extending off the northern part of Sir Beni Yas. Then steer southeastward and southward round the reefs northward and northeastward of Sir Beni Yas,

The reefs on both sides of the channel between Rashid and Sir Beni Yas show well.

With the peak of Sir Beni Yas bearing 270°, there is a detached patch 1 mile from the beach; and 3¾ miles off, with the highest peak nearly in range with the small hill near the east coast, there is a low, white, sandy islet only a few feet high.

Pass eastward of the detached patch just mentioned, and haul in for the sandy southeastern point of the island, when Meriton Bay will be seen over the low spit on its eastern side, and anchor in 7 fathoms, clay ¼ miles offshore, with the small hill on the eastern point of the island in range with the low southeastern point of the bay, sheltered from all winds.

Avoid the reef which extends about 1,600 yards eastward and southward of the southern extremity of the island.

To enter the harbor, which is not recommended for sailing vessels, as the tidal currents are strong, keep in the deep water close round the end of the sandy spit on the eastern side of the bay.

The channel between Rashid and Sir Beni Yas is the best passage in, that southward of Sir Beni Yas being less than 1 mile wide between the reef off the southern extremity of the island and that extending 2 miles from the mainland to the southward. This latter passage has 3 fathoms least water, and the tidal currents through are strong, with eddies.

The point of the mainland, 3½ miles southward of Sir Beni Yas, is low, with a reef extending off 2 to 3 miles. Jebel Thanni (Dhanni), 2 miles southwestward of it, is hilly and 350 feet high.

About 3½ miles southeastward of Meriton Bay is a little sandy islet, 3 feet high, and surrounded by deep water; 6 miles farther southeastward is Jazirat al Hamar, two low islets covered with stunted grass, on the shore reef, at the head of a deep bight in the reef; they are about 2 miles off the mainland, which is low, barren, stony hills.

The shore reef projects 5 miles northwestward from these islets and is steep-to, with from 14 to 18 fathoms near it, and its southwestern side can be approached to a distance of ½ mile.

There is a passage from Sir Beni Yas leading southward of Al Isha into Khur al Bazim, but it requires great care in its navigation; it should not be attempted by large vessels and is not recommended for any.

Zirkuh (Zirko), 12 miles northward of Bu Tini, is an island 2½ miles long north and south, 1½ miles broad, and has a rather remarkable peak 540 feet high (lat. 24° 53′, long. 53° 5′); it has no water nor any vegetation, except stunted grass and brushwood. A flat reef extends a short distance off nearly all round; on the eastern side ¾ mile.

There is anchorage in 4½ fathoms, with the south point of the island bearing between 248° and 270°, and from ½ to ¾ mile off-shore, sheltered from the shamal, but some swell rolls round the island.

Caution.—The soundings are little or no guide when approaching the islands and reefs in this part of the gulf. A 3-fathom shoal lies 1 mile northward from the island, and a 2½-fathom shoal 1½ miles southward from the island.

The tidal currents are strong at springs between this latter shoal and Zirkuh, causing ripplings like breakers, extending north and south.

Das (Dás), 18 miles northwestward of Zirkuh, is an island 1¼ miles long north and south, 1,400 yards broad, with hills about 260 feet high of even outline in the northern half, the southern part being low. There is very little fringing reef, but within 3 miles southeastward and southwestward from the island there are patches of 4 fathoms and less. There is no fresh water in the island.

Anchorage can be obtained about ½ mile eastward of the southeastern low sandy point, in from 5 to 8 fathoms, but much swell would probably be felt in a shamal, the island affording but little shelter. The best landing is on the western side of the southeastern point.

Caution.—Particular caution is required in the gulf southward and westward of Das, where safety depends chiefly upon a vigilant lookout. A vessel of more than 10 feet draft should not be under way after dark anywhere in this area.

Jazirat Karnein (Karnain), 12 miles southward of Das, is 1½ miles long northwest and southeast, and ½ mile broad. It has three remarkable detached dark peaks on its northern end, the highest of which is 190 feet high; the southern part of the island is low. There is deep water generally around the island, but only 4 fathoms for nearly 1 mile from its southeast point. No fresh water can be obtained.

Arzana (Arzanah), 25 miles northward of Sir Beni Yas, is an island 1.7 miles long north and south, and 1 mile broad; it is hilly toward the northern end, its highest hill being 200 feet high, and the southern part is a plain. There is no water on the island. The fringing reef round the island is nowhere more than 600 yards broad.

Anchorage can be obtained about ½ mile from the island in 4 to 5 fathoms water, with the south point bearing about 270°.

Pearl Banks.—The following pearl banks are in the vicinity of Arzana: An extensive bank, with 3 and 4 fathoms water, 8 miles north-northwestward; a 3-fathom bank 2 miles northeastward, which terminates 7 miles to the northward in 5 fathoms, and continues, with 1 fathom, 3 miles southward; a bank with 5 fathoms, or perhaps

less, 11 miles southeastward; and a small bank, with 4½ fathoms water, 2¼ miles southward of the island.

Diyina (Daiyínah), 12 miles northwestward of Arzana, is an island 1½ miles long northwest and southeast, 600 yards broad, flat and sandy, with scanty grass; the highest part is a black detached rock at the northern end, about 9 feet high. The island is bordered by a reef 700 yards wide, except the southern end, where there are 20 fathoms close to the western side.

Several pearl banks, with 4 and 5 fathoms water, lie from 4 to 17 miles northward of the island, and a coral reef has been observed about 7 miles to the northward; it appeared to extend 3 miles north and south, and to be nearly awash.

Anchorage can be obtained in 8 fathoms, from 600 yards to ½ mile off the south point, and it is more sheltered from a shamal than might be expected from the small size of the island.

Shirau (Shura'awah) (lat. 25° 2′, long. 52° 14′), 9 miles west-northwestward from Diyina, is small, and has little or no fringing reef; it has five or six little hummocks, about 40 feet high, which are nearly in range on easterly or westerly bearings; the middle part of the island is low. Shoal water extends at least ½ mile southeastward from the island. There is a good sandy beach for turtles. One mile to the northward is a detached small rocky pinnacle about 8 feet high, with 8 fathoms between it and the island.

In approaching Shirau from the northward, the island bearing between 180° and 190° appears to lead in depths of not less than 5 fathoms, but reefs may exist.

The bottom is very irregular between Diyina and Shirau (lat. 25° 2′, long. 52° 14′), and several reefs have been observed; the approach from the southward is also uneven.

Fair anchorage can be obtained in a shamal, 600 yards off the beach in the middle of the south side of the island, in 5 to 6 fathoms, sand; a vessel about 200 feet in length swinging inshore would have 4 fathoms water; there is no shelter farther out.

Patch.—A 1-fathom patch on a large pearl bank lies 6 miles northwestward of Shirau.

Dalma Island (Dalmah), 16½ miles northwestward of Sir Beni Yas, is about 5 miles long north and south and 2½ miles broad; it is generally hilly, but the southern part is a very low narrow plain 1½ miles long and terminating in a point. The hills from a distance appear like one long table hill, with a small barn-shaped peak near the northern end; this peak is 244 feet high. A fringing reef, ¼ mile wide, extends around the island, except at the south point; a patch of 3½ fathoms, sand, lies about 1 mile offshore eastward of the village. There is a little village and tower on the western side of the plain, with about 15 families, plenty of brackish water in wells, and many

goats; the village can be seen over the plain. The island is much visited by the pearl boats on account of the water, and during the season there is a large temporary population who establish a kind of bazaar and supply necessaries.

The soundings are irregular in the vicinity.

Anchorage can be obtained in 6½ fathoms about 800 yards southeastward of the low sandy plain, with the southern house of the village 289°, and the eastern extremity of the island 11°, and good shelter in a shamal. At 200 yards inshore of this position the water shoals rapidly from 5½ to 3½ fathoms. From the eastward approach the anchorage with the village bearing northward of 282°. Native boats lie on the western side, off the village, close to the reef, where they are sheltered from shamals by the southwestern point of the island, and are also sheltered from nashis. A patch of discolored water, apparently with a depth of 2 fathoms, has been reported at 4½ miles northeastward of the south extreme of Dalma Island.

Supplies.—A few chickens and eggs are obtainable at high prices.

Halat Masuma, 2¼ miles southward from the south point of Dalma, is a small sandy islet 2 feet high; it is situated on a shoal extending 1 mile around and 1½ miles south-southwestward, which has 8 fathoms water close-to. There is a narrow 3-fathom passage between the shoal and Dalma, through which the tidal currents, setting east and west, are strong. A rocky 3-fathom patch, surrounded by from 12 to 17 fathoms water, lies 6 miles southwestward from the islet.

The coast from Sir Beni Yas to Al Wakra, off which there are many small low islands, is most difficult and dangerous to approach, for the sea is much encumbered with shoals, which have been imperfectly surveyed and but roughly delineated. Navigation is also dangerous outside the reefs, westward of a line drawn from Dalma to Shirau, where the irregular nature of the bottom causes overfalls in all directions.

This locality should, therefore, be avoided; even the Arabs do not visit it in any craft larger than their pearl boats.

Zabut (lat. 24° 7′, long. 52° 27′), 12 miles southwestward from the southern extremity of Sir Beni Yas, and close off a point of the mainland is an island about 1 mile long northwest and southeast, ½ mile broad and probably about 120 feet high, with white cliffs.

A shoal extends about 8 miles northward and northeastward from the island; westward and northwestward of the island are two shoal patches and a large unsounded area, so it is not desirable to approach it nearer than from 10 to 8 miles.

Jebel Baraka (Barakah), a short distance inland from a low cliff on the mainland coast about 8 miles southwestward of Zabut, is some 250 feet high; Jebel al Wataid (Jebel Wutaid), 2 miles inland

about 7 miles further southwestward, is smaller. The low ranges of dark hills extending along the coast from Khur al Bazim terminate here, and a very low coast, called Subakha (Sabakhah matti) or the salt ground, begins and continues westward 25 miles. It is most desolate, partly swampy, and is the southernmost part of the Persian gulf. The coast is difficult to approach or even to sight, the foul ground extending from 4 to 6 miles off it. Ras Assak is a small point northwestward of Jebel al Wataid.

The Arabs say this is the hottest part of the gulf.

Yasat, 24 miles westward of Zabut, is a group of two level islands, about 15 feet high, with cliffs all round, and three islets to the southward; the group extends 6 miles north and south.

A small spit extends southeastward from the southern islet, and there is a shoal patch about 1 mile northwestward of it.

There is a clear channel, 2½ miles wide, southward of this islet, with irregular depths varying between 4 and 20 fathoms. The low swampy coast of the mainland is 8 miles distant, from which a reef extends 4 miles, with a 3-fathom patch outside it; the land is not in sight from close to the reef.

A reef extends 6 miles northeastward from the group, and a chain of great reefs continues 60 miles northward from these islands, through which there is no known ship channel, except between Fasht al Odaid and Rak Kareinein.

Westward and northwestward of the Yasat Islands, along the coast and inshore of the great outlying reefs to Khur al Odaid, the survey is more complete; but probably many undiscovered rocks and patches exist.

Anchorage can be obtained with the southern Yasat Islet bearing between 68° and 90°, distant ½ mile.

Mahamaliya (lat. 24° 7′, long. 51° 55′), about 6 miles west-southwestward of the southern Yasat Islet, is an islet of light color, from 15 to 20 feet high, flat-topped, with a notch in it, and cliffs all round. There is a small detached patch, with one fathom water, 1 mile o the southeastward.

Umm al Hatab, 8 miles west-northwestward of the southern Yasat Islet, is a low sand island about ½ mile in extent, with tufts of coarse grass. It is situated on a rocky reef, with several rocks above water off the northern end; the reef extends ½ mile from the eastern and western sides, but the southern side is clear.

Ras as Silla (Sila) is a slightly projecting point where the coast turns northward, at the western end of the low Subakha coast. Foul ground extends eastward and east-northeastward at least 2½ miles from the ras. The land from the ras rises gradually northward to a level summit about 100 feet high, and terminates on the coast in a

series of little terraces or steps. It is of light color, and sometimes has a sparkling appearance in the sun, from the fragments of crystals on its surface.

A little northward of Ras as Silla are some wells near the shore, but the water is brackish.

Kassar al Baya is above water on the coast reef, about 4 miles northward of Ras as Silla. The coast trends northward 13 miles from Ras as Silla, and then turns northwestward 2½ miles to Ras Masheirib, the reef extending from ½ to ¾ miles off-shore.

There is a succession of small, low, cliffy points and bays from Ras as Silla northward to a conspicuous little table hill, 75 feet high, at the point where the coast turns northwestward; from this point the coast is a range of low, white cliffs for 1 mile, when it falls toward Ras Masheirib, which is very low, rocky, and shelving.

Naita, about 2 miles northeastward of the table hill just mentioned, is a low sand islet less than ½ mile long and very narrow, with stunted tufts of grass. There are a few graves here, probably of fishermen. Several detached rocks lie off its northern end. The islet is on the southwestern edge of a great reef, which appears to join that extending northward from the Yasat Islands. A spit extends 1 mile southeastward from the islet, between which and the reef off the mainland is the southern entrance to Naita Strait.

The soundings in the bay, southward of Naita and westward of Yasat, are uneven, with overfalls of 3 or 4 fathoms. The bottom in the deeper parts is mud and on the shoaler spots rock or sand.

Naita Strait (lat. 24° 17′, long. 51° 47′) is 3½ miles long northwest and southeast, and about 1,200 yards wide, with a least depth of about 4 fathoms. It is the only known navigable channel leading northward. Keep on the Naita side of the strait, and when passing Naita look out for the spit extending nearly halfway across from the mainland; after passing that islet the strait widens. Foul ground extends 1 mile northwestward from Ras Masheirib. There is foul ground also for 3 miles northwestward of Naita Island, including an isolated patch at that distance. The tidal currents are strong in the strait, setting northwestward during the flood and southeastward during the ebb tide, approximately; the times of the turn of the streams are not known.

Dohat an Nakhla (Nakhalah) extends southward about 5 miles between Ras Masheirib and Al Fazaya, with the point to the southward; its width is ½ mile between the reefs extending from each side, and it has depths of from 3 to 5 fathoms; one or two shoal patches in the entrance render it unsuitable for shipping.

Al Fazaya, 5 miles westward of Ras Masheirib, and northward of a long point, separating Dohat an Nakhla from Dohat al Kawaisat,

to which it appears to be connected by shoal water, is an island 2½ miles long north and south, ¾ mile broad, about 50 feet high, with a level summit and low cliffs around. It is of light color similar to the coast.

Dohat al Kawaisat, on the western side of Al Fazaya, extends southward 7 miles, and is 1½ miles wide inside, where there is a depth of 6 fathoms. The narrowest part of the entrance is said to be 40 yards wide between the small projecting reefs and to have 3 fathoms water.

There are several rocky islets on the reef, which extends about half a mile off the coast between the entrance to Dohat al Kawaisat and Ras al Hazra.

Ras al Hazra, 10 miles west-northwestward of Ras Masheirib, is very low, rocky, and shelving; the coast from the ras trends west-southwestward 15 miles to Khur ad Duan (adh Dhuwaihin), and then turns north-northeastward 20 miles to Ras Bu Kamheiz. There is no information about the bay extending southwestward between Ras al Hazra and Ras Bu Kamheiz subsequent to the survey of 1823; it contains many shoal patches; the depth nowhere exceeds 10 fathoms, and is generally less, with mud bottom. The shores are low white hills, except in the vicinity of Khur ad Duan at the head.

Faireijat, the southern of which lies 6 miles, 86°, from Ras al Hazra, are two islets 2 miles apart north-northwest and south-southest, about 20 feet high, table-topped, and of light color. A reef extends about 2 miles southward from the northern islet.

Ghara, about 2 miles northwestward of Ras al Hazra, is a group, 3 miles in extent, of one rocky island, about 1 mile across, and numerous smaller ones; they are low and flat-topped. There is an extensive patch of foul ground 3 miles northward of the group, and shoals, with 2 fathoms and 1 fathom water, extend about 5 miles northward from 3 miles north-northeastward of Ras al Hazra.

Ras Bu Kamheiz (lat. 24° 34′, long. 51° 31′) is the eastern low rocky point of the promontory on the southern side of Khur al Odaid. Fasht Umm Janna extends 3 miles eastward and northward from it; the reef is 2 miles wide, and there is a small channel close round the point leading northwestward between the reef and the shore.

Khur al Odaid ('Odaid).—A point of low cliff, 4 miles northwestward from Ras Bu Kamheiz, is the southern outer entrance point of Khur al Odaid. Jebel al Odaid are two hills; the northeastern hill, immediately within the outer point, is 190 feet high, of light color, and has a table-top with several scallops; the other, 1½ miles farther southwestward, is 300 feet high. A reef extends ½ mile northward and 1 mile eastward from this point. The southern inner low rocky entrance point of the khur is 2½ miles westward of the outer

point, with a sandy beach between, on which are three wells of tolerable water and the ruins of a village. There are three rocks on the southern side of the channel, ½ mile eastward of the outer point.

Three other little rocks lie on the edge of the reef ½ mile northwestward of the inner point, close northward of which is the narrow channel leading into the khur, with 1 fathom water. On the northern side of this channel is a detached shoal about 2 miles long east and west, with deep water between it and the northern shore, but no passage through into the khur.

Khur al Odaid winds southwestward 5 miles, and then opens into a lagoon about 5 miles long north and south, and 3 miles wide; the southern shore is a continuation of the rocky hills of Jebel al Odaid, while the northern shore and the shores of the lagoon are perfectly white, round shaped sandhills, from 50 to 80 feet high, without any vegetation.

The average width of the khur is ½ mile, but the channel is contracted by banks and rocky islets to about ¼ mile; the depths are from 2 to 4 fathoms. The lagoon is shallow within the entrance and at the southern end, but has 6 and 7 fathoms in the northern part. The water in the inlet and lagoon is of a blue color and very clear. Khur al Odaid is frequented in winter by Abu Thabi fishermen, who remain some months. Very fine mullet are caught here.

Anchorage.—The anchorage at the entrance is 400 yards offshore, in from 6 to 10 fathoms, sand and shells, close to the northern outer entrance point; it is just inside a slightly projecting sandy point with no reef off it, with the outer hill of Jebel al Odaid bearing 170° and northward of the detached shoal above mentioned. It is difficult to estimate distance from the white sandhills, which appear farther off than they really are. The anchorage is sheltered in a shamal, and in a nashi there is not very much sea, owing to the great reefs to seaward.

Directions.—From the southward steer 0° from Ras al Hazra, passing between the 2-fathom shoal lying 3 miles north-northeastward of the ras and the patches 1 mile northeastward of the Ghara group. Keep eastward of the foul ground and the 3-fathom patch northward of this group, and westward of the 1-fathom shoal, the western extremity of which lies 12°, 5¾ miles from Ras al Hazra. Undiscovered shoals may exist, a good lookout is therefore essential.

Jebel al Odaid northeastern hill bearing 260°, leads northward of Fasht Umm Janna, which shows well and is steep-to; in approaching the anchorage, keep rather toward the northern shore to avoid the outer end of the detached shoal.

Kafai (lat. 24° 35′, long. 51° 44′), 12 miles eastward of Ras Bu Kamheiz, is an island about 3 miles long north-northwest and south-southeast, 2 miles broad, and low, with tufts of grass. A shoal ex-

tends 2½ miles southward from the island, and a shoal, which has not been explored and may be connected with the island, lies 4½ miles north-northwestward of it. Miyamat Entin, 3 miles southward of Kafai, are three very low islands, together extending about 3 miles north and south, on a great reef which stretches southward to Fareijat Islets.

For more than 15 miles eastward of Miyamat Entin the sea is reported to be encumbered with shoals, with no passage between them, but it has not been examined.

The Najhan coast (Nakiyan), from the northern entrance point of Khur al Odaid, trends north-northeastward 18 miles, and is high white sandhills. Ras al Allach is 4 miles farther northward.

Between Khur al Odaid and Fasht al Arrif, which extends southeastward from Ras al Allack, the offing is much encumbered with patches, but near the coast there is more open water. There is a small 1-fathom patch in the fairway 5 miles north-northeastward of Jebel al Odaid, 2 miles east-northeastward of this patch is a 3-fathom shoal, and 8½ miles north-northeastward of the small patch is a 1-fathom patch with 3 fathoms over 1 mile eastward of it. There are doubtless more patches undiscovered, but a good lookout enables a vessel to avoid them, no attempt being made to navigate with the sun ahead.

Las Hat, 12 miles northeastward of Jebel al Odaid, is a group of two small rocky flat-topped islets, 1 mile apart, with light-colored cliffs about 15 feet high, and several detached rocks.

A shoal ridge, 2½ miles south-southwestward of Las Hat Islets, extends southward 2 miles, and has 1 fathom water in places. About 3 miles northeastward of the group is a bank of white sand (lat. 24° 47′, long. 51° 39′), which barely covers, and from it banks extend 2½ miles northwestward.

Machasib, 14 miles east-southeastward from Las Hat, is a little flat rocky islet about 7 feet high, surrounded by a reef extending 1½ miles. There is a channel, about 1 mile wide, with 4 and 5 fathoms water, between the reef off the islet and a large shoal, the limits of which have not been determined, to the southeastward. The channel, between it and Fasht al Odaid, is about 3 miles wide, with overfalls.

Halat Dalma, 11½ miles, 54°, from Machasib, is a small sand bank nearly covered at high water. It lies on and about 2 miles from the western side of an extensive reef, the limits of which have not been determined, the southeastern side remaining nearly unexplored. There is no safe channel through or about this reef.

Fasht al Odaid, the western edge of which is about 8 miles east-northeastward of Las Hat, is 10 miles long north and south, 6 miles wide, and places of white sand appear to dry.

Fasht al Arrif extends 7 miles southeastward from Ras al Allach in a long narrow spit (lat. 24° 54′, long. 51° 42′). The land is rarely visible from off its extremity, but the reef shows well by day; the apparent end of the reef should be given a berth of about 1 mile, as there is a depth of 4 fathoms 1,200 yards off it. The tidal currents set strongly over the reef and must be guarded against. The channel between it and Fasht al Odaid is 3½ miles wide, and is the best by which to approach Khur al Odaid. The outer extremity of the fasht bears 25° 10 miles from Las Hat.

Jazirat Mishiryat is a little low islet on the Fasht al Arrif, 5 miles west-northwestward of the outer extremity of the reef, and eastward of the northern part of the Najhan sand hills; there is a channel 1½ miles wide between the hills and the islet, leading into an extensive backwater, which has not been examined. Ras al Allach, 3 miles northward of the islet, is the northern entrance point of the backwater.

The coast from Ras al Allach trends northward 17 miles to the entrance to Al Bida Harbor; it is low sand or stony desert to Jebel Wakra, a distance of 10 miles, the coast reef extending off from 1½ to 2 miles.

Umm al Hul (Húl), 6 miles northward of Ras al Allach, is a small low point, projecting but slightly. The width of the channel between the coast here and the outlying reefs has not been determined, but may be from 6 to 7 miles. The soundings are fairly regular in the channel, from 6 to 14 fathoms, but several ridges of coral and rock lie from 4 to 6 miles eastward of Al Wakra; they run north and south, are some 40 yards wide, and have 5 fathoms or less water, with from 14 to 17 fathoms between them; other shoals may exist.

Rak Kareinein, the outlying shoals, extend from close northward of Fasht al Odiad, 20 miles northward, with a breadth of from 10 to 15 miles, and are shoal patches, with deep water between. The shoals dry in places, and there is not any known channel through them.

There is a narrow channel between Fasht al Odaid and Rak Kareinein, in which depths of from 7 to 9 fathoms were obtained. A blind channel, about 2 miles northward of the eastern entrance to the real channel, leads about 2 miles westward into the reef and shoals abruptly.

Caution.—As the locality of these shoals has not been surveyed, caution is necessary; the shoals may extend farther northward than charted, or outlying patches may exist. It is recommended when navigating in these waters to have a steam launch or motor boat sounding ahead of the ship, as sighting the shoals, or the discoloration of the water over them, can not be entirely relied on.

The coast from Jebel Wakra to Ras Rakkin is low, except at Al Bida, where there is some slightly higher rocky ground, and a few

hillocks in other parts; the land is chiefly a stony desert, the northern part being very low. The sea northward of the latitude of Al Bida is clear of outlying detached shoals, but reefs continue along the coast and extend in places 10 miles from the beach, and the bottom may be seen before the land is sighted. Bar al Katr (Katar), the peninsula northward of Khur al Odaid, in inhabited by many different tribes of Bedawin, of whom the Manasir bear a bad character.

The towns of Katr (Katar), chiefly Al Bida and Wakra, send 200 boats to the pearl fishery.

Tidal currents.—The tidal currents set southward along the coast approximately during the flood tide, and northward during the ebb tide, but the times of the turn of the currents are not known; the currents appear to attain a velocity of about 1 knot.

The current sets westward, approximately, during the flood tide, through and over the reefs southward of Al Bida, meeting the current, which sets westward along the shore from Abu Thabi, in the vicinity of Khur al Odaid, and in opposite direction during the ebb tide.

Al Wakra (Wakrah) (lat. 25° 11′, long. 51° 36′), situated on the shore of a bay about ¾ mile deep, is a large town, divided into two parts by an inlet, which is a boat harbor. A castle, with a high square tower and a smaller tower, about ¾ mile inland from the southern part of the town, is conspicuous. In the northern part of the town is a large fort with three towers.

The town has probably about 300 boats. Jebel Wakra, 1 mile to the southward, and close to the coast, is a level-topped rocky hill of brown color, 85 feet high.

A rock, with less than 6 feet water, lies about 2 miles 108° from the town, and a patch with 1¾ fathoms water lies 3 miles 66° from the town; the water generally near Al Wakra is considered to be somewhat shallower than shown on the chart.

A small vessel can anchor in 2¾ fathoms, sand and clay, with the highest tower in the fort, 299°, and the tower of the castle 232°, and large vessels eastward of the town, about 3 miles offshore, in 7 fathoms.

Landing.—The landing is protected from the north and east by a high sandbank. There is a coral reef off the town which boats must go around or cross at high water.

Supplies are scarce. Fish can be obtained in small quantities; also water.

The coast from Al Wakra trends northward 6 miles to Ras Abul Mushut, the southeastern point of Al Bida Harbor, which is low, rocky, and shows well against the sandy coast. A 1½-fathom patch

lies 4 miles 57° from Ras Abul Mushut, and shoal water probably continues from it to the 1¾-fathom patch 3 miles 66° from Al Wakra. The shore reef extends about ½ mile eastward from Ras Abul Mushut.

From Ras Abul Mushut the coast trends westward for 5 miles, and there turns somewhat sharply to the northward, forming a reef-obstructed bay in which is Al Bida Harbor.

Al Bida Harbor is in the southern part of the bay formed by the receding coast westward and northward of Ras Abul Mushut, where reefs nearly completely surround a clear area of shallow depths which has a length of about 4¼ miles in an east-northeastward and west-southwestward direction by about 3½ miles across in a northeast and southwest direction between Jezirat as Safla, on the northern side of the harbor, and Ras Nessa Fort, on the southern shore of the bay, about the middle of the town of Al Bida.

Depths.—The whole approach to the harbor is obstructed by reefs and shoal water of from 2½ to 3 fathoms, which extend about 6 miles offshore. The 5-fathom range is reported (1913) to be about 12 miles east-northeastward of Jazirat as Safla.

The greater part of the harbor has between 4 and 5 fathoms water, white mud or clay bottom, and the inner anchorage off the town has from 2 to 3 fathoms. The entrance is shallower, the depths just outside varying between 2 fathoms on the northern side of the channel and 2½ fathoms on the southern side; in 1898 a sounding of 1¾ fathoms was found just outside the narrows.

The draft of a vessel should not exceed 16 feet when entering the harbor at high water nor 10 feet at low water.

Entrance.—The entrance, 2½ miles northward of Ras Abul Mushut, is ½ mile across the points of the reefs which inclose the harbor, but it is not more than 600 yards wide between the 3-fathom curve.

Reefs.—Reef projects in a northerly direction for over 2 miles from Ras Abul Mushut, and nearly meets the extremity of another reef coming from the opposite direction, that to the northward being covered by from 2 to 6 feet of water.

Reefs.—Ras Bu Abut, 2¼ miles west-northwestward of Ras Abul Mushut is low; between them a great reef projects 2 miles northward to the southern side of the entrance; it is chiefly rocky, with only a few feet of water.

Jazirat as Safla (Safliyah Island), 3 miles northward of Ras Bu Abut, is about 2 miles long east and west, very narrow, and curves with the northern side of the harbor; it is low, sand, and grassed. The northern reef projects southeastward 1½ miles from Jazirat as Safla; it is chiefly sand, and outside the entrance trends northeastward and northward for some miles.

Ras Nessa, 3.6 miles westward of Ras Abul Mushut, and separated from it by Ras Bu Abut, is a salient point southeastward of the anchorage. It is surrounded by the town, and there is an inconspicuous fort on it. Southeastward of Ras Nessa is the sheik's house, on the top of which is a flagstaff from which a flag is usually flown, but it is noticeable only when within 4 miles of the town. Southwestward of Ras Nessa is a minaret and a large white house.

Westward of the white house are two forts; the more important of the two appears buff colored, and has two square towers and one circular tower close together.

Al Bida or Gutten Fort, in the center of which is a conspicuous circular tower, is 1¼ miles westward of Ras Nessa; it is elevated, and northward of it are the ruins of a castle recently destroyed. The high tower of Al Bida, which may sometimes be seen before the land is sighted, may from points of view appear amongst the towers of the fort to the eastward; between Al Bida Fort and the castle ruins is a buff-colored tower, which may be used as a range mark for entering the harbor. Northwestward of the castle ruins a village extends along the shore; 2½ miles northwestward of the tower is a buff-colored castle, to the northeastward of which is a conspicuous white castle.

The castles and towers, owing to refraction, are visible at a distance of from 12 to 14 miles at sea. The small buff-colored castle 2.3 miles northwestward of Al Bida Fort, owing to its high elevation, can be seen sometimes before other objects in the harbor.

Jezirat al Ali, a small islet, 8½ miles northward of Ras Abul Mushut, is a good mark for approaching Al Bida; it is small and of a brown color, with a small peak, probably about 30 feet high, at its eastern end. In some lights it appears nearly white.

Shoal.—About 9 miles 92° from the northern end of Jezirat al Ali there is a shoal depth of 3½ fathoms.

Tides.—It is high water, full and change, approximately, at Al Bida at 4 h. 30 m.; spring rise about 6 feet.

Directions.—From the northward, as the Katr (Katar) coast can not be approached near enough to be sighted southward of Ras Laffan, steer southward parallel with the coast, keeping in depths between 5 and 7 fathoms until eastward of Jazirat al Ali, when steer westward and make that island, bearing in mind the 3½-fathom patch 9 miles eastward of it. Being clear of the patch and about 6 miles from the island, steer about 193° and pass northwestward of the 1½-fathom patch, 4 miles 57° from Ras Abul Mushut, and when the round conspicuous tower at the northeast corner of Al Bida Fort bearing 249°, keep it so; this bearing leads between the shoals into the harbor. These directions are taken from the chart, and the greatest care is necessary in using them.

From the northeastward or southeastward, bring Halul to bear 65°; keep it so astern until lost sight of and then continue 245° direct for Al Bida. Approach the shoals cautiously, and pass northward of the 1½-fathom patch 4 miles 57° from Ras Abul Mushut, observing that the round conspicuous tower at the northeast corner of Al Bida Fort bearing 251° appears to lead northward of it, and continue as before directed. The broad flat outside the harbor, extending 5 miles to seaward beyond the reefs, has, with the exception of the 1½-fathom patch mentioned, from 3 to 2¼ fathoms water, white sand bottom. There are depths of from 6 to 4 fathoms close to the outer edge of this flat.

On account of the position of the sun the reefs are best seen for entering early in the forenoon, and for leaving late in the afternoon; at other times they are very difficult to make out.

A small vessel can enter at low water guided by the eye and lead; the reefs are then more clearly seen. A vessel of moderate size could anchor to await the tide about 6 miles eastward of Jazirat al Ali.

Approaching the entrance (lat. 25° 19′, long. 51° 36′) with the round conspicuous tower at the northeast corner of Al Bida bearing 249° the channel will be plainly seen from aloft; the northern shoal will appear light green, the southern shoal with patches of dark color. The water deepens to 4 fathoms in the narrow part of the channel.

If a vessel should get too far to the southward and Jebel Wakra should be sighted, she would be in dangerous proximity to the northern side of Rak Kareinem.

When the little peak of Jazirat al Ali bears about 350° just open eastward of Jazirat as Safla, steer 247° direct for Al Bida fort, which leads about 300 yards northward of the spit off Ras Nessa.

Anchor about ½ mile off-shore with the southern extremity of the white castle round conspicuous tower at the northeast corner of Al Bida fort, bearing 276°, and Ras Nessa 138° in from 2½ to 3 fathoms, outside the native vessels, and clear of the foul ground on the western side of the bay.

There is often a land wind early in the morning, but it does not extend far from the coast.

Katar (Al Bida or Gutteh on Plan) is the name of the combined three towns in Al Bida Harbor, viz, Doha (Dohah), Al Bida, and Little Doha. Doha, the eastern town, ½ mile southwestward of Ras Nessa, is partly walled, with several towers. The Shaikh's house is at a large round tower, with a flagstaff, on the beach about the middle of the town; westward of this tower is a small bight, where boats are hauled up for repair. The reef dries ¼ mile off.

Little Doha, northwestward of and joining Doha, has a square fort on rising ground at its southwestern corner. Al Bida joins Little

Doha, and the three places together extend 1 mile along the shore. Al Bida is situated on the side of the rising ground, and the Shaikh's flag is flown from the castle. Al Bida fort, which is situated on rising ground, has a large tower and is conspicuous.

There is a tower near the wells 1½ miles southwestward of the town, and here there is a little cultivation; with this exception the whole country is desert.

The Shaikh of Katar or Al Bida has authority over the other chiefs. The three places together may contain a population of about 5,000 mixed tribes. They were formerly constantly at feud with the Bedawin, and it may not be safe to be outside the walls after dark.

There are no large bagalas here, but many pearl boats, and the inhabitants are all employed in the pearl fishery.

Supplies.—Fish, meat, etc., can be procured in the bazaar, but the natives are by no means friendly (1913), and the prices are high. Water is dear and indifferent; the best is brought in skins from the desert, some distance from the town. Firewood is procured from the interior, and also, showing its scarcity, from Clarence Strait, some 250 miles distant.

The shore of the bay from Al Bida turns northward, and is fronted by an extensive reef running out nearly 1¾ miles, which nearly dries. Between this reef and Jazirat as Safla is a narrow channel leading into a basin westward of that island, with from 1½ to 3½ fathoms water.

The bottom near the shore between Al Bida and Ras Rakkin is white sand or rock, and generally shows well in the clear water.

Jazirat al Ali ('Aliyah Island), 3½ miles northward of As Safla, is small and of a brown color, with a little peak, probably about 30 feet high, at its eastern end, which is a mark in entering Al Bida Harbor.

Ras al Kateifan (Ras Kutaifan), 4 miles northwestward of Jazirat al Ali, slightly projects, and is probably some 50 feet high, rather higher than the adjacent coast.

Shoal water, of less than 3 fathoms, with some dry places, extends from 4 to 10 miles off the coast between Ras al Kateifan and Ras an Nuf, 10 miles to the northward; it projects farthest in lat. 25° 32′ N.

Dohat Lusail (Lusail), between Ras al Kateifan and Ras an Nuf, slightly recedes; it is shallow, but is frequented by pearl boats, which run in over the shoal for shelter in shamals.

Ras an Nuf (Nof) is a low rocky point.

Ras Matbakh (al Matbakh) (lat. 25° 40′, long. 51° 34′) is 3 miles north-northeastward from Ras an Nuf, and between is the entrance to Khur Shajij (Shakik) a creek and backwater, the entrance to which has 1 fathom water. There is a small village with several towers here. The 3-fathom curve is 4 miles off Ras Matbakh,

within which depth the ground is foul; there is a dry sand bank 3 miles eastward from the point.

Khur Dhakira (Dhakirah), 3½ miles northward of Ras Matbakh, is small and shoal.

Shoals.—A series of shoal patches have been observed about 6 miles off the coast, and extending about 8 miles northward of Ras Matbakh. The shoals had apparently about 4 feet water, and from 16 to 20 feet inside; they were plainly seen during daylight and the lead gave warning of approach. As the coast is very low, the distance from it may have been overestimated.

Less water was reported in 1910 within the 10-fathom curve to the northeastward of these shoals than is shown on the chart.

Ras Laffan, 14 miles northward of Ras Matbakh, is very low sand; the coast reef extends about ½ mile off it.

Al Howeila (Huwailah), 6 miles west-northwestward of Ras Laffan, is a small town, with a square fort some 30 feet high. Westward of the town is a small bay, in which the reef extends 1½ miles offshore. The people were formerly pearl fishers, but in 1887 the place was found deserted. Ras al Maruna is the northern point of the bay, and close inshore to the southward pearl boats shelter during a shamal.

Fuairit (Fuwairat), 2 miles northwestward from Ras al Maruna, is a little walled town, with several towers, on the shore of a small khur; there are some small white sandhills immediately to the northward.

Ar Riyat, about 2 miles northward of Fuairit, and just northward of the sand hills, is a small village with several towers; Al Ghareya, about 2 miles farther northward, is a little village, also with towers, established by people from Al Wakra.

Ras Umm al Hasa (Umm Hasah) lies 6 miles north-northwestward of Ras al Maruna; it rises to a small rocky hillock, some 20 feet high, the coast reef extends off about 1 mile, and shoal water is reported to extend some distance further off. Boats shelter close to the coast southward of the ras in a shamal.

Ras Rakkin (Rakan) (lat. 26° 11′, long. 51° 13′), 8½ miles northwestward of Ras Umm al Hasa is the northwestern point of a T-shaped island, nearly 2 miles long east and west, narrow, the greater part being less than 200 yards wide, and very low, with tufts of grass; the T-head at the western end is 1 mile long. It is situated about 1 mile inside the northern extremity of the reef extending from the peninsula of Bar al Katr, and is nearly 1½ miles off the coast, from which the island can be reached at low water by wading. Native boats shelter southward of the island. The 5-fathom curve is 3½ miles northward of Ras Rakkin, and there is a 2¾-fathom patch about 2 miles north-northwestward of the ras.

A small rocky mound, conspicuous from seaward, stands on the mainland, 2½ miles southeastward of Ras Rakkin.

Tides.—The time of high water, full and change, at Ras Rakkin has not been determined, but it appears to be about 5h., and the rise about 5 feet at springs.

Ar Ruweis (Ruwais), 2½ miles southward of Ras Rakkin, is a small town on the peninsula; it is seen before the land when approaching from the northward.

Ras Bu Amran. See Chapter VI.

Halul Island (Halul) (lat. 25° 40′, long. 52° 25′), 71 miles east-southeastward of Ras Rakkin, and just within the edge of the Great Pearl Bank, is about 1½ miles long northeast and southwest, 1 mile broad, 192 feet high, and hilly; the fringing reef round the island extends off 400 yards in places, and shoal water extends about 1,200 yards northward and northeastward of the island.

Cairn and beacon.—A cairn, surmounted by a small staff and ball, stands on the summit of Halul Island, 192 feet above high water.

An iron girder embedded in masonry, surmounted by an iron triangle, about 60 feet in height, stands about 200 yards from the beach on the southeastern side of the island; this beacon is known as Lawrence Beacon.

The cairn and beacon in range, bearing 304°, lead to the anchorage.

Anchorage.—There is anchorage in 7 fathoms about 600 yards off the southeastern coast, but much swell rolls round the island in a shamal, and the bottom, being patches of sand and rock, is not very good holding ground.

Landing.—There is a landing place in a gap in the low cliff, southwestward of a sand beach northwestward of the anchorage, but it is only suitable for boats of light draft, and as there are many patches of rock it should not be attempted in heavier weather. With southeasterly winds, landing here would be dangerous, and then there is a more sheltered place on the southwestern part of the island. The island is visited by the pearl boats, but is quite barren and without fresh water.

Soundings.—The soundings are not much guide in approaching the island (lat. 25° 40′, long. 52° 25′); there are great overfalls everywhere around it; from 15 to 20 miles off the island, and also about 1 mile off, there are depths of from 10 to 14 fathoms, whilst two small shoals, with 6 fathoms water, lie 115°, 25 miles, and 298°, 15 miles, respectively, and a similar shoal, with 7 fathoms water, 152°, 20 miles from the island.

Shah Allum Shoal, 45 miles, 6° from Halul, see Chapter X.

CHAPTER VI.

PERSIAN GULF—RAS RAKKIN TO JAZIRAT BUBIYAN, INCLUDING KUWEIT AND KHUR ABDALLA.

(Lat. 26° 11′, long. 51° 13′, to lat. 29° 45′, long. 48° 40′.)

General remarks.—The whole coast between Ras Rakkin (lat. 26° 11′, long. 51° 13′) and Jazirat Bubiyan, 260 miles northwestward, is a low sandy or stony desert, with a few little hills here and there. The only vegetation, except near Al Katif and one or two other towns where there are date trees, is the coarse grass growing in tufts on the sand hills, and small brushwood in places. The coast is fronted by extensive reefs until within 70 miles of Kuweit; and many islands, all small and low except Bahrein, lie off it, some about 50 miles distant. With the exception of a few towns this coast is rarely visted by Europeans. Large tracts of coast are without villages or settled inhabitants, and it is probably not safe to wander away from the towns on the mainland without any armed party.

Tides.—the times of high water, full and change, vary from about 6 h. 5 m. at Bahrein, through 12 h., to 0 h. 13 m. at Kuweit, and the rise from 6½ to 10½ feet at springs.

Observations made between Bahrein Island and Al Hawar show that the spring rise there is about 4 feet. In summer, the southwest monsoon drives the water into the Persian Gulf, and raises the general sea level about 1 foot. As a rule, southeasterly winds raise, and northwesterly winds lowr, the level.

Tidal currents.—The tidal currents are felt everywhere on the Great Pearl Bank, especially around reefs and islands. The westgoing current appears to run about six hours, ending some time after high water, and the eastgoing current the next six hours, but the times of the turn of the currents are not known. The westgoing current sets from Ras Rakkin along the coast southward into Dohat Salwa, and between Ras Rakkin and Bahrein Island; off Bahrein Island and amongst the outlying reefs the currents are very erratic and much affected by the wind, but, to a certain extent, they follow the general trend of the reefs, attaining, at springs, a velocity of from 1 to 2 knots, and even 3 knots at times, but this is exceptional.

Eastward of Bahrein Island the tidal currents are for the most part weak; there are, however, heavy tide-rips southward of Bahrein, in Dohat Salwa, caused by sudden alterations in depth.

The westgoing current appears to turn southwestward and southward on the bank northeastward of Fasht al Yarim, and set southward on the eastern side of Fasht al Yarim until abreast of Ras al Ain, where, joining the current flowing westward along the northern edge of the Khaseifa Reef, it turns southwestward into Bahrein Harbor. Northward of Fasht al Yarim, and across the eastern part of the Sheikh Gata Bank, the current sets southwestward, turning southward on the western side of Fasht al Yarim until within 1 mile of that bank and 2 miles of Najwa Reef, and southeastward between Fasht al Yarim and Khur Fasht in the Khur al Bab; but it sets southward over Khur Fasht and westward of it.

The current sets southward over Khaura Bank (lat. 26° 38′, long. 50° 18′) and southwestward between Chaschus and Najwa Reefs.

The southern edges of the Khaura and Sheikh Gata Banks are marked by overfalls.

The current sets southeastward between Muharrak and Bahrein Islands, and southward to the eastward of Muharrak Island. In Bahrein Harbor entrance, northward of Muharrak, it sets west-southwestward at a velocity of from 1 to 2 knots.

The east-going current sets over and between the several reefs in opposite directions to those during the westgoing current.

Ras Rakkin to Ras Tanura.—The coast from Ras Rakkin trends generally south-southwestward, about 68 miles, and then turns northwestward and northward, 96 miles, to Ras Tanura, and in the bay thus formed is Bahrein, a large island. From the eastern side of Bahrein reefs extend to within 5 miles of Ras Ashiraj, which is situated 17 miles southwestward of Ras Rakkin, and from these reefs there are depths of from 2 to 3 fathoms across to the fringing reef off Bar al Katr. Southward of this the bay has been but little explored, though an intricate channel could probably be found navigable by small craft, with a draft of less than 10 feet. The British naval vessel *Investigator*, with a draft of 14½ feet water, endeavored to navigate around Bahrein, starting from the western side, but between Ras al Bar, the southern extremity of Bahrein, and Al Hawar, to the southeastward, such a network of reefs and shoals was fallen in with that the attempt had to be abandoned.

Ras Bu Amran, 2 miles south-southwestward of Ras Rakkin, projects nearly 1 mile to the northward; it is low, but rises to a small rocky mound.

Bu Thaluf (Abu Dhuluf), about 1½ miles south-southwestward of Ras Bu Amran, is a small town with four conspicuous towers on its fort.

Khur Hasan, 7½ miles southwestward from Ras Bu Amran, is a small and very compact walled Arab town on the coast; ½ mile northward of it is an islet on which stands a low round tower. There are two small villages in ruins between Bu Thaluf and Khur Hasan.

Ras Ashiraj ('Ashairik), 7 miles southwestward of Khur Hasan, is low but prominent and rocky; on it is a lookout tower in ruins. Eastward of it is a shallow bay with an entrance 1½ miles wide, and extending the same distance southward. On the eastern side of this bay are the ruins of the once important town of Zubara (Zubarah), now abandoned. In 1902, the old fort, though fast crumbling away, was still conspicuous.

Marks.—Between Ras Rakkin and Ras Ashiraj, the coast is low and of so light a color that it is difficult to sight, especially when enveloped in the prevailing haze. The marks described can, however, generally be seen, and are the only means of distinguishing the localities. It should be borne in mind that the Arabs frequently desert their towns, in which the best buildings, being constructed of soft coral rock, with mortar but little better than mud, soon fall to decay, so that what are now described as prominent marks may cease to be so in a few years, and others may have been erected.

From Ras Rakkin to 4 miles from Ras Ashiraj (lat. 26° 00′, long. 51° 00′), a reef extends from 1 to 2 miles offshore, and becomes steep-to a short distance from Ras Rakkin, and plainly visible with good light; it nearly all dries, making landing very difficult except at high water. From Ras Ashiraj, the reef extends 200 yards; in the bay eastward of it, and from the coast northward of the bay, the sand dries and shallow water extends a long way off. To approach Ras Ashiraj make the land about Ras Rakkin or Ras Bu Amran, and steer southwestward along the edge of the reef, keeping a good lookout for indications of shoal water, as this locality has not been closely surveyed.

Anchorage.—Vessels of 10 feet and less draft anchor about ½ mile northwestward of Ras Ashiraj in 2¾ fathoms; and those of 15 feet draft, 5 miles north-northwestward of the ras, in 3¼ fathoms.

The coast from Ras Ashiraj trends southward 28 miles to the head of Dohat al Adhwan, a shallow inlet 9 miles long, with a greatest breadth of 3 miles, in which the deepest water is 2 fathoms. The ruins of Rubeija are situated 2 miles southward of Ras Ashiraj, and there are no signs of habitation between them and Dohat al Adhwan. Forts and huts appear to have been constructed at Dohat al Adhwan shortly before 1902, and there is constant boat communication with Bahrein.

Al Hawar (Hawar Island).—On the western side of the entrance to Dohat al Adhwan is a group of islands as yet but little

explored; Al Hawar, the western and largest, is about 10 miles long, north and south. The waters about this group are shallow and unsurveyed.

Off-lying reefs.—A bank, with 3¾ fathoms water, lies 13 miles, 330° from Ras Rakkin; it has not been closely examined, and should be avoided. Vessels of light draft pass between it and Fasht ad Dibal, but vessels of deep draft keep northward of it, in not less than 6 fathoms.

Fasht ad Dibal, the northern extremity of which lies 296°, 15 miles from Ras Rakkin, is 4¾ miles long north and south, 2¾ miles wide, and dries in patches; its northern edge is fairly steep-to. With a good light, Fasht ad Dibal can be seen at all times of tide.

Caution.—As the soundings give no indication of approach to Fasht ad Dibal, and the westgoing current turns southward in its vicinity, keep well northward of it.

Kata (Katah) ad Jaradeh lies southwestward of Fasht ad Dibal, being separated from it by a channel 2½ miles wide, with depths of 2 to 3 fathoms. It practically dries, and on its southeastern side is a narrow strip of sand about 1 mile long, parts of which only just cover; this sand bank, however, varies both in size and shape.

Katat Ekhchejera (lat. 26° 1′, long. 50° 58′), 2 miles northwestward of Ras Ashiraj, has 6 feet water. The sea breaks on the rock at low water; and at high water the sea over it has an oily appearance, and is slightly discolored.

Bahrein eastern reefs.—At 4½ miles southward of Kata ad Jaradeh is the eastern extremity of the reefs extending some 15 miles or more eastward from Bahrein Island, the whole space within being apparently encumbered with shoals, at present quite unexplored. There are depths of from 1 to 2¼ fathoms between Kata ad Jaradeh and these reefs.

Northward of Bahrein reefs, and westward of Kata ad Jaradeh, there are no shoals until the reefs off Muharrak Island are met with.

Ras as Sawad (lat. 25° 37′, long. 50° 51′) is the northwestern extremity of the mainland near the southern end of Al Hawar, and from this the coast trends southward about 30 miles on the eastern side of Duhat Salwa. For some distance northeastward of Ras as Sawad, according to native report, the coast is a series of moderately high stony hills.

Duhat Salwa (as Salwa).—The extent of this bay to the southward has not been defined, but the Arabs state that there are extensive ruins at its head. The few soundings taken show that the bottom is very irregular. The western shore trends north-northwestward about 26 miles to a point on the southeastern side of a bay, in which lies Jazirat Zakhnuniya; it is a range of sand hills, one of which is said to be known as Jebel Mowa.

Jazirat Zakhnuniya (Zakhnuniyah) is about 4 miles long northwest and southeast, and there is a village and a fort on it, subject to the Shaikh of Bahrein. There is a shallow channel between it and the mainland, and shoals are charted within about 2 to 3 miles northeastward and northwestward from the island.

Ojar ('Okair), about 8 miles west-northwestward from the northern extremity of Jazirat Zakhnuniya, is a small place, little more than a customhouse, an old Arab fort, and a few buildings, surrounded by the desert, on the western shore of a khur extending about 4 miles north-northwestward from its entrance, which is westward of Ras Seiha, and appears to be about 2 miles wide. It is the seaport of the Wahabi, but is unhealthy, and fever is common. Ras Seiha (Saiya) is the southern extermity of a long, low sandy peninsula, and there was a pole beacon on it when visited by the British naval vessel *Lapwing* in 1903.

The *Lapwing* anchored in 2½ fathoms water, eastward of the peninsula, with a fort bearing 260°, 4 miles.

Depths.—There is a shoal about 1,600 yards in extent, with from 4 to 6 feet water, at the entrance to Ojar khur, and inside it there are depths of from 4 to 6 fathoms until near the fort. Between Ras Seiha and Bahrein, the depths vary from 3 to 14 fathoms. The tidal range is about 2 feet.

The fort, a well-built low structure, with four towers, apparently some 60 feet high, near it, is visible from the northward; water can be obtained from a well at the towers, and other supplies either by camel from Al Hasa or by bagala from Bahrein.

A well-built jetty, about 150 yards long, with 3 feet water at its outer end, extends from the fort. There is a considerable caravan trade with the interior.

The coast from Ras Seiha trends north-northwestward 22 miles to the entrance to Dohat Thalum (Dhalum), which bay is about 7 miles in extent and shallow. Its shores are uninhabited. Hamadiya Hill, on the southern side of the bay, is about 1 mile long east and west, and 120 feet high. North Hill, 2½ miles west-northwestward from Hamadiya, is 100 feet high, small, and round; these hills are good marks.

There are numerous sand hills extending some distance inland on the western and northern shores of Dohat Thalum, but only one, about 55 feet high, northward of the bay, is at all conspicuous.

Kureya, the northern entrance point of Dohat Thalum, is low sand, and from it the coast trends northward about 7 miles to the entrance to Dohat Ain as Sih (Saih), which bay is about 2 miles in extent and shallow, with about 6 feet water in the entrance. About 1 mile off the entrance, and lying parallel with the coast, is a long,

narrow sand bank which partially dries. An isolated sand hill, 55 feet high, is situated 1¾ miles northward of the entrance, and 3¾ miles farther northward is a group of four sand hills, of which one is named Zabanat (Tall i Zabanat); the isolated hill and Zabanat are good marks.

The northwestern extremity of Bahrein, and the nearest part of that island to the coast, is about 12 miles eastward of these sand hills. The passage between is much obstructed by reefs, intersected by narrow and shallow channels, of which the easternmost is considered the best, and is the only one which has been examined.

Ras Kuwakib.—Jilat al Husain (Kal'at al Husain) is a small fort 11 miles northward of Dohat Ain as Sih, inhabited by a few fishermen. Ras Kuwakib (lat. 26° 20′, long. 50° 14′), close to it, is the southern point of Al Katif Bay.

Near the coast southward of Ras Kuwakib is the Lailiya (Lalyah) district, said to be fertile and well watered.

A reef extends 8 miles eastward and northeastward from Ras Kuwakib, with Chaschus, dry sand banks, near its outer edge.

Jebel Thahran (adh Dhahran), about 4½ miles, 260°, from Ras Kuwakib, is the southeastern peak of a range of hills; it is a long, sloping hill, with a remarkable and rather flat-topped peak, 500 feet high, rising abruptly from the middle, and is conspicuous.

Mathra (Mudrah), the northwestern peak of the range, 3½ miles northwestward of Thahran, is 416 feet high and conical. Coast continued, further on.

Bahrein Island (Awal) is 26½ miles long north and south and 10 miles broad at its northern end; it gradually narrows southward, and ends in Ras al Bar. Some rocky table-land, from 100 to 150 feet high, extends many miles southward from 4 miles southward of the north coast, and nearly across the island; it is bordered on all sides by small cliffs. Partly on it, and partly at its northeastern foot, 7 miles southward of Al Menama, are the village and hill fort of Ar Rufa (Ar Rifa) (Rifa'ash Sharki), about 210 feet high, with several towers, which are visible from seaward over the date trees on southerly bearings, but sometimes, owing to the growth of the trees, are difficult to distinguish, even from aloft.

Jebel Dukhan (ad Dukhan), 12 miles from the northern end, and about midway between the east and west coasts, is a small compact group of dark hills, 410 feet high; in clear weather it is the first part of the island seen when approaching it, but it has been reported (1913) not to be easy to distinguish until near the entrance.

The coasts of the island are low, and along the north coast is a belt of very fertile well watered land 2 or 3 miles wide and covered with date groves, lucerne, and a few fruits and vegetables of indif-

ferent quality. The remainder of the island is uncultivated, owing chiefly to the want of water.

Landmark.—The radio mast situated near Al Menama, in lat. 26° 13′ 45″, long. 50° 35′ 30″, is sighted simultaneously with Jebel Dukhan.

The north coast of Bahrein Island from Ras ar Ruman (Rumman), the northeastern point of the island, on which is Al Menama town, trends westward, with a slight curve southward, 3½ miles to the Portuguese fort. A large ruined mosque, with two minarets about 70 feet high, is situated 2.6 miles southwestward from the ras and 1 mile inland. The upper parts of the minarets are visible from the northward, over the date trees, until near the inner harbor; they are good marks, but are not easily made out. The coast is bordered, for distances between ½ mile and 1¼ miles, by reefs, which dry.

Portuguese fort (lat. 26° 14′, long. 50° 31′), in ruins, is little better than a heap of stones; it is called by the natives Kibliya, and stands in a gap in a date grove, 150 yards from the beach; it appears from seaward a shapeless light-colored mass. In 1902 its highest part, about 60 feet high, was at the edge of the moat about the middle of the southern side of the fort.

Lighthouse Rock, 2 feet high, is on the edge of the reef, 1 mile 341° from the Portuguese fort, and is not conspicuous.

Liya, 1,600 yards northward of Lighthouse Rock, is a rock which dries 3 feet, with foul ground for ½ mile westward of it, and shoal water from the shore reef to 1 mile northeastward of it.

The coast from Portuguese fort trends westward 2½ miles to Shereiba village, in which is a tower close to the beach and higher than the houses; it then trends southwestward 1¾ miles to the northwestern extremity of the island, on which is Al Bidia (Budaiya), a town. Date groves extend along the whole of the north coast.

The west coast of the island, from its northwestern extremity, trends southward, and the date groves are in detached clumps. Reefs and shallow banks extend from 4 to 4½ miles northwestward of its northwestern extremity, and off the west coast for some miles to the southward, rendering approach, except by small country craft, impossible. Sala and several other reefs, on the main reef, dry, and here and there are rocks above water.

Raka Island, about 1 mile southwestward of the northwestern extremity of the island, is about 1,200 yards long north and south, 300 yards broad, 5 feet high, and covered with scrub.

Cliff Island, 1½ miles westward of the southern extremity of Raka, is about 1,400 yards long east and west and 400 yards broad; its western end is a cliff 52 feet high; the eastern end is low sand.

Um Nasan Island (Umm Na'san), 1.1 miles southward of Cliff Island, and 1½ miles offshore, is 3 miles long north and south,

2 miles broad, low and sandy, but has two rocky peaks, one, 66 feet high, and ½ mile within the western point of the island, being conspicuous; the other, ½ a mile to the northeastward, is 25 feet high.

The reef on which these islands stand extends about 1¼ miles westward of Cliff Island, and about ¾ mile westward and southward of the western part of Um Nasan.

Tidal currents.—In the channel westward of Um Nasan the current sets southward from about 3 hours before until 3 hours after high water, and northward from about 3 hours after high water until 3 hours before the next high water, at a velocity of from 2 to 3 knots at springs.

Zellag, a small pearling village, is situated about 10 miles southward of Al Bidia; the Shaikh owns several large bagalas.

Landing is good at Zellag, but bad both northward and southward of it.

The coast from Zellag (lat. 26° 03′, long. 50° 29′) trends south-southwestward 4 miles, and then turns south-southeastward 13 miles to Ras al Bar, the southern extremity of the island, a long low sandy point. Southward of Zellag all cultivation and date palms cease, the country becoming a stony desert with small patches of camel grass and scrub here and there.

Shoal water extends a long way offshore, especially off Ras al Bar, which can not be approached within about 5 miles. On the eastern coast of the island the extensive fringing reef prevents any communication except by small boats.

Directions—Bahrein to Ojar.—British naval vessel, *Lapwing*, in 1903, proceeding from Bahrein Harbor to Ojar, passed between Khur Fasht and Marwadi, where the depth is 15 feet. These reefs are usually marked by the discoloration of the water, but when the *Lapwing* passed through at one hour after high water, and in the middle of the day, they were not seen, nor was any current then experienced.

Jebel Thahran, Jebel Dukhan, Um Nasan Peak, Cliff Island, Portuguese fort, and the northern extremity of the trees on Muharrak Island are good marks for fixing the position when passing through the narrows westward of Um Nasan Island; great difficulty is occasionally caused by refraction and mirage. The two sandy islets on the western side of the passage are conspicuous. It is not advisable to proceed through the narrows with a favorable current.

For Zellag, approach with the village bearing 81°, and anchor in 5 fathoms, about 2¼ miles offshore, with Um Nasan Peak bearing 25°. The depths decrease suddenly from 5 to 3 fathoms.

The east coast of Bahrein, from Ras ar Ruman, trends southeastward about ¾ mile to a low sandy point, on which is Halat an Nannas, a little fishing village; Ras al Jasra is 1½ miles south-southeastward

of the low point, with a bay between. There is a village and detached date grove on Ras al Jasra, and a fresh-water spring on the beach below high-water level.

The coast at Ras al Jasra (lat. 26° 13′, long. 50° 37′) turns southwestward 1 mile, and then northwestward and westward 2½ miles on the northern side of an extensive shallow backwater. Sitra (Sitrah), an island on the southern side of the entrance, 1½ miles wide, is 4 miles long north and south, and 1½ miles broad, with a narrow khur between it and Bahrein, which dries. The northern half of the island is covered with high date trees, and the eastern extremity of this part terminates abruptly in a bluff, with a conspicuous tree just southward of it. Sitra village and fort are amongst the trees. Jazirat Nabbi Sali, 2 miles southwestward of Ras al Jasra, in the backwater, is about ½ mile in extent and covered with date trees.

Mahana as Saghira, a small fishing village, is on the southern end of Sitra Island, and there is apparently a wide and deep channel about ½ mile eastward of it, leading southward; it, however, has not been examined. Mahana al Kabira, on Bahrein Island, is 1 mile southwestward of Mahana as Saghira. The coast from the southern point of Sitra Island trends generally southward 20 miles to Ras al Bar.

Khur Kaliya is bounded on the west by the northeastern part of Bahrein Island; on the north by Muharrak Island and the reefs between it and Bahrein; on the east by a reef extending 3 miles southward from Muharrak Island, and terminating in Kassar Diwan, 1 foot high; and on the south by the reefs extending from Sitra Island. The kuhr is about 3 miles long north and south, 2 miles wide, and the only entrance available for shipping is between Kassar Diwan (lat. 26° 11′, long. 50° 40′) and the outer edge of Sitra Reef, but boats can cross the reef at the northern end of the khur.

Depths.—The entrance is 400 yards wide, but a bar stretches entirely across it, and has a least width of 120 yards. There is a channel across the middle of the bar, about 60 yards wide, with depths of from 12 to 16 feet; it shoals abruptly on the eastern and gradually on the western side. The bar is steep-to, especially on its outer side; the remainder of the entrance channel is steep-to on both sides, and has depths of from 25 to 54 feet.

Shoals.—A shoal, 1,200 yards long northwest and southeast, and from 200 to 400 yards wide, with 11 feet least water, lies immediately off the entrance, and there is a good channel on each side of it up to the bar. Good anchorage can be obtained northeastward of the shoal in 7 fathoms water, sheltered from the shamal.

The middle of the khur is occupied by a large sand bank with from 7 to 16 feet water, the least water being near the entrance;

there is a large area around this shoal with depths of from 18 to 45 feet.

Beacon.—An iron beacon, surmounted by a black ball, 12 feet high, stands nearly 400 yards within the eastern edge of a drying sand bank, which extends westward from the reef on the western side of the entrance; it is known as Khur Kaliya beacon.

Anchorage.—The best anchorage is 1½ miles within the entrance between the middle sand bank and the eastern reef in from 24 to 28 feet. The khur is frequented by native craft which run up to the head, close to Muharrak town.

Tides and tidal currents.—It is high water, full and change, at Khur Kaliya at 6h. 5m.; springs rise 6½ feet, neaps, 5 feet. The tidal currents in the entrance attain velocities of from 1¼ to 3¼ knots, and about ½ in the khur.

Directions.—In a vessel of suitable draft, approach with Jebel Dukhan bearing 229°, and when Kassar Diwan is in range with the minarets, 284° steer 270°; when that rock is in range with a conspicuous house on Ras al Jasra, 298° keep it so until the rock is distant from 600 to 800 yards. Then turn west-south-westward toward the southern side of Sitra date grove, and again northwestward to cross the bar Khur Kaliya beacon open westward of Menama clump. When over the bar steer northward to the anchorage.

It is advisable to enter in the morning, and to leave in the afternoon, when the position of the sun is favorable for seeing the reefs.

Muharrak Island, northeastward of Bahrein, and separated from it by a shallow strait, about 1¼ miles wide, is 2¾ miles long east and west, 2½ miles broad, and is low and sandy, with several conspicuous groves of date palms about 40 feet high, which are first seen in hazy weather, but Jebel Dukhan will be seen just before them in clear weather. Kalali village, on the northeast extremity of the islands, has two small towers, the eastern being the larger. Simahi (Simahij), Ad Dir (Dair) (Daiyir,), and Basaitin (Busaitin) villages, with their date groves, are on the northern and western coasts of the island.

Landing on the island is only possible between half flood and half ebb.

Muharrak (lat. 26° 15′, long. 50° 37′), a large town, is on the southwestern point of the island. On a low detached bank, which becomes an islet at high water, about 200 yards southward of the town, is a square fort with one large and three small towers, conspicuous from the anchorage.

Water.—Bu Mahir (Abu Mahur), the fresh-water submarine spring from which the town is chiefly supplied, is about 500 yards eastward of this fort. Submarine springs are characteristic of these

islands; several are mentioned in the following pages; often by putting down a hollow bamboo the fresh water rises through it above the sea.

Al Hadd, a town on the long southeastern point of Muharrak island, is conspicuous from the eastward. Arad peninsula extends southwestward 1 mile between Al Hadd and Muharrak towns; it is ½ mile wide, and on its southwestern part is a large ruined fort and a date grove.

Saya (Sajah), about 1,600 yards from the shore, and on the drying reef extending westward from Muharrak Island, is an islet about 20 yards in extent, 2 feet high, of light color, and scarcely noticeable; there is a spring of fresh water on it.

Khaseifa (Khasaifah) (lat. 26° 17′, long. 50° 38′), on the reef extending northward of Muharrak Island, and about 700 yards offshore, is a small rocky islet, 8 feet high, of light color, and, with the sun on it, is easily made out at high water when seen clear of the land. Between it and the shore are fresh water springs which uncover.

Bahrein Harbor lies northward of Bahrein Island, and between the reefs extending from it and Muharrak Island, with Fasht al Yarim to the northward. Fasht al Yarim does not, however, prevent a considerable sea, bad for boats, getting up in the outer harbor during a strong shamal, but communication with the shore is seldom interrupted, and vessels ride easily at anchor.

The inner harbor, a bight in the reefs west-northwestward of Al Menama Town, is about 1 mile in extent, suitable for small craft, much better protected, and usually full of bagalas; vessels of more than 15 feet draft should not enter it. The reefs bordering the harbor are all flat, and, with a good light, show well. There are numerous fish weirs on them, but, with few exceptions, they are a long way inside the outer edge of the reef. Discolored water often extends westward of Khaseifa Islet, across the harbor.

Depths.—There is a least depth from seaward to the outer harbor of 21 feet, but 23 feet could apparently be obtained; and there is a least depth of 16 feet into the inner harbor.

Lightbuoys and buoys.—The following buoys, which belong to and are maintained by the Government of India, have been laid down in the entrance to, and in, Bahrein Harbor, but they sometimes break adrift, and their being in position can not therefore be relied on:

A red with a white horizontal band conical light buoy, exhibiting a flashing white light is moored about ¼ mile north-northeastward of an 18-foot patch in the entrance channel.

A red conical buoy, surmounted by a cage, about 1 mile west-northwestward of the buoy just mentioned.

A red conical buoy off the extremity of West Spit.

Ras Zarwan—Beacon.—Ras Zarwan is the western point of the reef on the northeastern side of the Inner Harbor; on it is a white masonry beacon surmounted by a small staff.

An occasional light is placed on the beacon by the British India Steam Navigation Company for working their steamers. It can not be relied on.

Tides and tidal currents.—It is high water, full and change, at Bahrein Harbor, at 6 h. 5 m.; springs rise 6½ feet, neaps 5 feet.

The tidal currents set eastward and westward in the entrance to the Outer harbor at a velocity of from 1 to 2 knots, and in the Inner Harbor northwest and southeast at a velocity of ½ knot.

Pilots.—Apparently native pilots go out when they see a vessel approaching, but the services of a pilot appear to be scarcely necessary.

Fasht al Yarim (Jarim), which protects Bahrein Harbor from shamals, is about 13 miles long north and south, and, toward its northern end, 8 miles broad. The middle and southern parts are rock and sand, but the northern is coral; the whole reef shows well at low water; on the northern end are black lumps of decayed coral, and the southern part appears as a large sand bank, called Jadum.

Ras as Shabb (Shab) (lat. 26° 33′, long. 50° 32′), the northern point of the reef, lies 16 miles, 343°, from Khaseifa Islet; there are depths of 3 fathoms ¼ mile northward of the ras, and 2½ fathoms 2 miles northwestward of it; about 4 miles to the eastward there is a depth of 5 fathoms. The northern part of the reef is out of sight of land, and caution is necessary in making Bahrein from the northward.

Haraka is a small bight on the eastern side of the reef, with from 1 to 2 fathoms of water, in which the pearl fishing boats shelter during a shamal.

Southward of Haraka and off Ras al Ain, 5 miles north-northeastward of Jadum, the southern point of the reef, the water deepens very gradually for 4 miles eastward to the 3-fathom curve. Eastward of Jadum, the water deepens suddenly from 2 to 3 fathoms 1 mile from the reef.

Kaliya (Kalai'ah), 4¾ miles north-northwestward from Jadum, is a rock of Fasht al Yarim, about 20 feet in extent, which just covers; it can generally be seen when near the reef except at high water.

Anchorage.—There is good anchorage eastward of Jadum, completely sheltered from the shamal.

Approach—Bu Athama, a small patch, with 6 fathoms water, lies 46 miles, 346°, from Ras Rakkin, just within the 20-fathom curve.

The British Indian S. S. *Kilwa* reported in June, 1890, that soundings of from 3 to 5 fathoms were obtained about (lat. 26° 52′, long 50° 56′) 5 miles west-southwestward of Bu Athama; the bottom was visible, and, by the tide ripples around, the shoal appeared to extend about ¼ mile east and west.

A vessel reports having touched a submerged obstruction in lat. 26° 54′ 00″, long. 50° 46′ 00″.

The edge of the Great Pearl Bank extends about 40 miles east-southeastward from Bu Athama; there are overfalls of from 9 to 20 fathoms on the bank, which is here called Abu Kharab.

Rennie Shoal, 38½ miles, 48°, from Ras Tanura, is about 1 mile in extent, with 2 fathoms water, rock bottom.

About 2¾ miles southward of Rennie Shoal is a patch also with 2 fathoms water, rock bottom. The 20-fathom curve passes closely on both sides of the shoals and about 1 mile northwestward of them; there is no visible indication of the shoals.

Tidal currents.—In the vicinity of Rennie Shoal the currents appear to set westward during the flood, and eastward during the ebb tide, at a rate of about ½ knot.

Shoals.—A bank, about 4 miles in extent north and south and 5 miles east and west, with from 4 to 4¾ fathoms water, lies with its center about 15 miles, 78°, from Ras as Shabb.

Depths of 5½ and 6 fathoms have been reported over a considerable area northward of Fasht ad Dibal, and in the approach to Bahrein Harbor from the eastward.

Directions.—For Bahrein from the southward and 5 miles northeastward of Halul Island, steer 312° for 75 miles, and then steer 254°, direct to the outer light buoy. This latter course leads on a line of soundings with depths of from about 19 fathoms to 7 fathoms, which depth is maintained, except the reported soundings of 5½ and 6 fathoms above mentioned, until about 8 miles from the outer light buoy, when the depths gradually decrease. The radio mast Jebel Dukhan, and possibly Jebel Thahran, may be in sight before the buoy is reached. A lookout from aloft should be kept for any shallow patches, as the locality has not been thoroughly sounded. From abreast the outer light buoy proceed as directed, "Entering the harbor."

If a vessel, in approaching, is set to the southward of the entrance, the clumps of date trees on Muharrak Island, Kalali, Al Hadd village, Khasefa Islet, Jebel Dukhan, and Rufa Fort, should be seen in time to safely ascertain the position; if set to the northward, see the following directions.

From the northward take a good departure from the Persian coast, and avoid the Rennie shoals and the 3-fathom patch west-southwestward of Bu Athama. From Abu Shahr, when Jabal Direng bears 64°, with the land distant 14 miles, and in about 20 fathoms water, a course 197°, allowing for tide, leads midway between, and about 6 miles distant from, the Rennie shoals and the 3-fathom patch west-southwestward of Bu Athama.

Keep a lookout from aloft; the edge of Fasht al Yarim will probably be shown by the pale green color of the water, especially in the morning. The tidal currents set westward and eastward, and both the Fasht al Yarim and the Fasht ad Dibal, must be guarded against, but with close attention to the soundings the position should not be much in error.

In clear weather, as Bahreim is approached, Jebel Dukhan may be seen from a distance of about 25 miles, and then the date palms at Riya, the northernmost clump on Muharrak Island, situated northwestward of Simahi, will appear. Jebel Dukhan bearing 202° when it is open eastward of the Riya clump of date trees, leads direct to the outer lightbuoy.

On a near approach, should the buoy be adrift or out of position, Jebel Dukhan bearing 208° or Riya clump bearing 232°, leads in 5 fathoms until Kalali tower and the remaining clumps on Muharrak Island can be seen, and the vessel's position approximately fixed.

Entering the harbor.—A least depth of 19 feet water can be obtained by passing ¼ mile northward of the outer lightbuoy, and then steering 255° and a least depth of 22 feet by passing 1 mile southward of the outer lightbuoy and then steering 270° until the inner lightbuoy bears about 240°. Then steer southwestward in about 23 feet least water, and pass 200 to 400 yards southeastward of the inner lightbuoy. When the western minaret is in range with the western shoulder of Jebel Dukhan, 182°, keep this mark on, which leads southward in a least depth of 21 feet, and anchor as directed below.

As the buoys are not to be relied on, the following remarks will be useful.

From about the position of the outer lightbuoy, steer for Jebel Thahran, bearing about 262°, which leads northward of Muharrak Island flat, and when the old Portuguese fort (lat. 26° 14′, long. 50° 31′) bears 202° keep it so to the anchorage; or, keep the bearing on until the western shoulder of Jebel Dukhan is in range with the western minaret, when follow that route as already directed; caution is necessary.

The Portuguese fort (lat. 26° 14′, long. 50° 31′) shows well in the early morning, but is difficult to distinguish in the afternoon. The

minarets are somewhat difficult to make out, but with the aid of a glass two small pointed towers can be seen just above the date palms.

Attention must be given to the tidal currents.

Anchorage.—Large vessels anchor a little westward of the range, in from 24 to 30 feet water, with the northern extremity of Muharrak Island bearing between 85° and 90°; this position is ½ mile eastward of West spit buoy. Vessels of 15 feet draft stand on and anchor in from 18 to 19 feet a little eastward of the range, with the fort southward of Muharrak town bearing 102°, and the minarets 183°, and those of lighter draft anchor in 17 feet with Ras Zarwan beacon bearing about 0°, ½ mile.

The closer in a vessel is able to anchor, the less sea will be felt during a shamal.

Al Menama (Manamah), the principal town and port of Bahrein, is situated on Ras ar Ruman and the land for some distance to the westward. The town is dirty and the houses are poor, the only consipicuous building being the house of the British Political Agent, which, with its flagstaff, is situated about 200 yards southwestward of the ras. A clump of date trees, on rising ground, 700 yards southward of the ras, is conspicuous, and near it is the Christian cemetery, surrounded by a high wall.

Piers.—A stone pier, dry from half ebb to half flood, extends 150 yards northwestward from the British Agency. The customs pier, of which some 600 feet has been constructed, is intended, when completed, to admit of boats going alongside it at low water. The customs pier is accessible at all states of the tide. Boats's crews should be warned against wading with bare feet, as the coral is sharp, and cuts caused by it are liable to be poisoned.

Radio.—A radio mast, 105 feet in height, is situated about 800 yards southward from Ras ar Ruman.

Government.—The Bahrein Islands are under the rule of Shaikh Isa bin Ali, the head of Al Khalifah family, who was placed on the throne by the British Government in 1869. Since 1904 the British Government has been represented by a political agent belonging to the political department of the Government of India.

Population.—There are about 100,000 people in the islands, about half of them being in the four principal towns, thus: In Bahrein—Menama 25,000, Al Bidia, 8,000; in Muharrak Island—Muharrak, 20,000, Hadd 8,000, the remainder being distributed in small villages in the northern part of Bahrein and in Muharrak. Bahrein, as a port and trade center, is the resort for people from Persia, Turkish Arabia, Katr, and Trucial Oman, and to a less degree from Central Arabia.

Almost the entire population is Muhammadan, but there may be 200 or 300 non-Muhammadans in Menama.

A large number of the people, estimated at 17,500, are engaged in the pearl fishery from the middle of May to nearly the end of October.

The language of the country is Arabic; in Menama, however, there are considerable Persian and Hindustani-speaking communities.

Climate and health.—The climate of Bahrein is extremely damp at all seasons, and is undoubtedly unhealthy. The extremes of heat and cold are not excessive, but the very great humidity makes even moderate heat disagreeable. Very strong northwesterly winds prevail, which are varied during the hot weather from the beginning of May till well into October, by southeasterly winds or calms, when the humidity is such that there is a difference of only 2° between the dry and wet bulb thermometers at a temperature between 95° and 100° F.

The barih, or 40-days shamál, often makes the climate in June and July comfortably cool and pleasant.

Menama (lat. 26° 14′, long. 50° 35′) is, away from the bazaar, fairly free from insect pests.

The average annual rainfall is 2.7 inches; the highest temperature 108°, and the lowest temperature 41°.

In autumn and sometimes in spring, there is a good deal of fever. Rheumatic afflictions are very general. From 1905 to 1911 Bahrein was visited every second year by plague, and the epidemic in 1911 was the severest yet on record; the number of deaths that then occurred in Menama, Muharrak, and the neighboring villages, was estimated at 2,000. Cholera occasionally visits the islands.

Hospitals.—The maintenance of a charitable medical dispensary, built by local contributions and known as the Victoria Memorial Hospital, was undertaken by the Government of India from 1905, and the institution itself has been attached to the Political Agency. There is an American mission at Menama, one of its members being a medical man, who has a well appointed hospital for both European seamen and natives, under his care.

Supplies.—Water is plentiful, but the quality is poor, and there are no facilities for shipping it. Provisions are procurable in small quantities, but are very expensive, excepting rice, of which a better quality can be obtained here than at other ports in the gulf. Very little timber can be obtained, and that only at exorbitant prices. There is no coal.

Bustard and sand grouse exist, but are preserved by the Shaikhs for hawking.

Fishing is good. The natives use as bait a peculiar kind of weed, of which a quantity can be obtained on the shore in front of the Consulate.

Trade.—The principal articles of export are pearls, specie to neighboring countries, rice, piece goods, dates, coffee, tea, oyster shells (uncertain), and sugar.

The principal articles of import are pearls from the neighboring fisheries, specie from India, rice, piece goods ghi, coffee, dates, slaughter animals, sugar, tea, fuel, and tobacco. The importation of arms and ammunition, except with the consent of the British Government, is forbidden by the treaty engagements of the Principality; and that of alcoholic liquors and drugs is prohibited by local regulation, but permission is granted only to Europeans to import for their personal use. The British agent should be applied to before entering into any contract with the natives.

Cargo is landed entirely by sailing boats, an unsatisfactory method, as it is usually blowing half a gale or is calm; the boats can only get near the wharf at high water, and otherwise have to be discharged by small boats, and then by coolies and donkeys at some distance from dry land. All goods from steamers are taken direct to the chief custom-house at Menama (lat. 26° 14′., long. 50° 35′).

Weights and measures.—The following are the most important of the weights and measures in Bahrein: Weights—1 rutl or kiyás=1.54 pounds (avoirdupois); 1 ruba'=4.11 pounds; 1 mann=57.6 pounds; and 1 rifa'ah=576 pounds. Many of the weights in use are under standard. In the pearl trade the unit of weight is based on the Indian measure called "chao," but the Bahrein chao equals 4 Indian chaos. One hundred dukra=1 chao; 330 chaos=1 miskal (149 grains troy); 66 habbe=1 miskal. Measures—1 dhira' (cubit)=18¾ inches; 4 dhira'=1 ba' (fathom)=6 feet 3 inches.

Currency.—The Indian rupee (15 Rs.=£1), and its silver and copper fractions are firmly established as the general medium of exchange in Bahrein. Nickel coins are rarely seen. Indian currency notes of 1,000 and 500 Rs. are in fairly common use.

English sovereigns are appreciated, but are not plentiful.

The Maria Theresa dollar is current, but is not much seen; its persistence is due to the trade relations with the Arabian mainland, where it is in general use; the gold Turkish lira is accepted freely, but the rupee values of the dollar and the lira are subject to constant fluctuations.

The term kran is sometimes used to denote the value of 6½ annas; there is no corresponding coin.

Local products.—Agriculture in Bahrein is almost exclusively confined to date growing, and dates and date juice, with a small quantity of lucerne seed, are the only agricultural produce. There are no industries beyond a certain amount of boat building, and a small manufacture of sail cloth. Producing little but pearls, all necessaries are imported.

Communications.—The vessels of the British India Steam Navigation Co.'s subsidiary mail service, between Bombay and Basra, call at Bahrein on their passages from and to Bombay. The fast service vessels from Bombay transfer mails for Bahrein at Abu Shahr (Bushire) to the subsidiary service vessel from Basra.

Communication with the mainland of Arabia is by native craft, the time taken being entirely dependent on the weather. There is also much traffic of native craft between Bahrein and the Persian coast.

Internal communication in the islands is by donkey, and optionally between places on the coast by boat. Except one or two private vehicles and water carts in Menama, there is no wheeled traffic in the islands.

Post.—An Indian post office is located in the British agency.

There is no telegraphic communication.

Khur al Bab, the channel southward and westward of Fasht al Yarim, leads from Bahrein to Al Katif. A vessel of more than 15 feet draft should not use this channel, and all vessels should take a native pilot at Bahrein.

The entrance to the khur is between West Spit in Bahrein Harbor and Jadum, the southern part of Fasht al Yarim. The khur trends northwestward with an average width of 1 mile, and depths of from 21 to 38 feet, with some shoal patches of 18 feet.

About 4 miles from West Spit, a branch runs westward between Marwadi Reef, a small sand bank which hardly covers, and is always marked by flocks of birds, on the southern side, and Khur Fasht, on the northern side.

Khur Fasht, a reef 2½ miles westward of Jadum, is about 3 miles in extent, and on it are two or three sand banks, of which the largest is on the southern side, and mostly dries about 4 feet, but the southeastern corner dries only 3 feet. On the reef near this sand bank is a fresh-water spring in 3 feet of water, which is much used by the pearl fishers during the season, but in the cold weather it is closed up by the natives. It is difficult to find the spring, except at low water, when the sea is smooth.

The reef is entirely of coral, of which the greater part is dead; it is generally steep-to except on its southeastern side, where a spit extends a short distance. The eastern edge of the reef generally shows plainly, and is step-to, but it is said to be very difficult to make out either this reef or Marwadi, when high water occurs about midday.

Ras (Rak) al Yadda is a large sand bank southwestward of Khur Fasht; its extent has not been determined. There are depths

of from 20 to 31 feet in the channel, which has a least width of 800 yards, between Khur Fasht and Ras al Yadda.

Chaschus is a line of several sand banks on the outer part of the reef extending 8 miles northeastward from Ras Kuwakib; its northeastern point is 7 miles northwestward of Khur Fasht. The sand banks are shifted about considerably by strong winds and tidal currents; they are generally visible from half ebb to half flood from the southeastward. A bank with from 1½ to 3 fathoms water extends nearly 3 miles eastward from Chaschus, and is the western side of Khur al Bab.

A large shoal, with from 15 to 18 feet water lies midway between this bank and Ras as Sala (lat. 26° 25′, long. 50° 27′), the western point of the southern part of Fasht al Yarim.

Najwa, a reef lying about 350°, nearly 6 miles from Chaschus, is 2½ miles long north and south, and 1¼ miles broad. There are two sand banks on the reef; the large one in the middle, being always dry, is generally visible from the southeastward between half ebb and half flood; the other, on the southern end, shows only at low water.

Rak as Surra, a pearl bank midway between Najwa and Fasht al Yarim, is 3 miles long east-southeast and west-northwest, and 1 mile broad, with from 2 to 2¾ fathoms water. The bank, deepening to the eastward into 4 fathoms, joins the Adala Bank projecting northwestward from Fasht al Yarim, a detached patch of which, with 2¼ fathoms water, lies about 297°, 5 miles from Ras as Shabb. The water is generally much discolored over the rocky parts of Rak as Surra.

The channel between Rak as Surra and Najwa has from 5 to 9 fathoms water. There is an area, from about 2½ to 10 miles northeastward of Najwa, with depths of from 6 to 15 fathoms.

Khaura Bank (lat. 26° 39′, long. 50° 19′) extends north-northeastward about 8 miles, with a breadth of about 5 miles, from 3 miles northward of Najwa, and has depths of from 2¼ to 5 fathoms.

Sheikh Gata Bank, 5 miles northward of Ras as Shabb, is about 8 miles long east and west, 4 miles broad, and has depths of from 3¾ to 5 fathoms.

Between Khaura and Sheikh Gata Banks there is a channel with depths of from 10 to 12 fathoms, and between Adala and Sheikh Gata Banks a channel with 7 fathoms water.

On all the pearl banks the bottom is uneven, and sudden differences of from 2 to 3 fathoms in depth are often found.

Directions.—From Bahrein northward, through Khur al Bab. When northward of West Spit Buoy with Riya date trees, at the north end of Muharrak, bearing 102°, steer 292° until the Portuguese fort is in range with Jebel Dukham; then steer 320° through the

channel, guarding against the west-going tidal current which at times is very strong on the southern side of Marwadi Reef, and also on the southern side of Khur Fasht. The middle of Jebel Dukhan bearing 193° leads eastward of Khur Fasht.

The water shoals gradually toward Fasht al Yarim, except off Ras as Sala, where it is steepto. Mathra Peak bearing 267°, or Kaliya Rock, 57°, leads northward of Khur Fasht; from either line steer 317°, allowing for tide, which leads over the 15-foot bank lying in midchannel westward of Ras as Sala, and thence southwestward of Rak as Surra.

When northward of Khur Fasht, after losing sight of Jebel Dukhan, Kaliya Rock, which shows well from half ebb to half flood, Jebel Thahran, Mathra, and the sand banks on Chaschus and Najwa Reefs when near them, are the only marks.

The water shoals suddenly from 7 to 3 fathoms near Najwa Reef, therefore pass about 2 miles eastward of it on a northerly course, and after rounding its northern end in not less than 5 fathoms, steer direct to Ras Tanura.

From the northwest extremity of Rak as Surra, with 2¼ fathoms water, Mathra Hill bears about 234°, and the dry sand bank on Najwa is not visible; therefore keeping the dry bank on Najwa well in sight insures being westward of Rak as Surra.

The channel between Chaschus and Najwa is 4½ miles wide, with from 2 to 7 fathoms water; Mathra Hill, bearing 246°, leads northwestward of Chaschus, and the same hill bearing 230° leads southeastward of Najwa, in about 2½ fathoms water.

Ras Khali (lat. 26° 30′, long. 50° 10′), a projecting point of the shore reef about 8 miles southward of Ras Tanura, has a freshwater spring on it, always covered. The passage between Ras Khali and Najwa is between 2 and 3 miles wide, with about 3½ fathoms water, and the eastern edge of the mainland reef, after forming a bight extending 2½ miles westward from Ras Khali, trends northward to near Ras Tanura.

The coast from Ras Kuwakib trends northwestward 22 miles to Al Katif, 10 miles southeastward of which place are a number of small rocky hills, some 50 feet high, called by the Arabs Marakibat Sadun, from their resembling the hulls of bagalas.

Dammán is an important town on the coast northeastward of the Marakibat Sadun. The principal fort, which has a high tower with a flagstaff in the middle, is some 70 feet above the sea; it stands on an island on the shore reef, nearly joined to the mainland; there is also a smaller fort on the mainland.

The channels through the reef, by which native vessels approach the town, are shallow, and probably only practicable at high water.

The island, channels, and coast behind have not been examined, and are only approximately delineated; there is said to be a narrow inshore channel, which dries.

Saihat is a town and large fort on the coast about 5 miles south-southeastward of Al Katif. Thick date groves commence here and continue northward to about 3 n s beyond Al Katif. There is a sand hill, probably about 100 feet high, within the town. Eastward of it is Khur Saihat, a channel commencing in the bight of the reef westward of Ras Khali, of which one branch is the best channel for large boats proceeding to Al Katif; the other, turning southward, is that by which boats approach Damman. On the coast, midway between Saihat and Al Katif, is Anich ('Anik) Fort.

Al Katif is an important coast town about 10 miles west-southwestward from Ras Tanura. It is situated in an oasis of the same name, which extends 9 miles northward and 9 miles southward from the town, and, as an average, 3 miles inland; the oasis is bounded on the north and west by a large desert tract. The fort, the only part visible from seaward, is large, but contains little besides the residence of the Shaikh and his followers, the town being scattered in the surrounding date groves. There is a minaret from 80 to 100 feet high in the southern part of the fort; the citadel, in the northwestern corner, is said to have been built by the Portuguese. A brown sand hill, about 100 feet high, lies 3 miles west-northwestward of the town.

There being many fresh-water springs in the locality, date and fruit trees, vegetables, melons, etc., are grown, and some rice cultivated. There is a good bazaar in the town.

The climate of the oasis is damp and unhealthy, and malaria is prevalent. The total settled population of Al Katif oasis was estimated at 26,000, and of this number 10,000 belonged to Al Katif town and its suburbs.

Tarut (Tárút), an island on the reef which extends about 7 miles eastward from the coast, and off the town, is about 4 miles in extent; its eastern part is closely grown with high date trees, and amongst them, near the middle, is Tarut Fort, with towers, some 80 feet high, which show above the trees. Darin, a town with a square fort, is situated on the southern end of the island, and Sanabis, a large fishing village, on the east coast northeastward of Tarut Fort.

Khurs.—Al Katif town can be reached by boats of 7 feet draft: the larger boats enter by Khur Saihat. About 3 miles eastward of Darin is the entrance to a smaller khur; this kuhr trends westward, passes close to Darin, and joins Khur Saihat near Burj Abul Lif, a small fort on the reef 1¾ miles westward of Darin, above which the larger boats can not go. The main channel passes ¼ mile eastward

of Burj Abul Lif, but there is a small branch which admits such boats, at high water, close up to the walls of the fort. There is also a channel, navigable at high water, round the northern end of Tarut Island, which joins the khur from Burj Abul Lif, off Al Katif; anchorage could probably be obtained off the khur, about 5 miles eastward of Darin.

Ras Tanura (Tanúrah) (lat. 26° 38′, long. 50° 10′) is the extremity of a strip of sand, with sand hills on its outer edge, which extends southeastward about 9 miles from the mainland, 10 miles northward of Al Katif, and is about 100 yards broad in places. The sand hills appear to be some 40 feet high, and show white with the sun on them; the point is level sand over coral, about 12 feet high. The reefs inside this point show well, especially the large main reef off Tarut Island.

A reef extends 1¼ miles northeastward from the sand strip 3 miles northwestward from the point, but there is no reef near the point; there are soundings of 3¾ fathoms about 1 mile eastward of the point, and from this position the water shoals to the southward and southwestward; between these shoals and Najwa Reef, about 5 miles southeastward, are depths of from 5 to 7 fathoms.

Anchorage.—The reefs extending from Tarut Island and the mainland northward of Al Katif approach the southwestern side of Ras Tanura sand strip, but leave a passage about ¼ mile wide and 1 mile long immediately inside the point, with depths of from 22 to 39 feet. Anchorage can be obtained in from 30 to 39 feet from about ¼ to ½ mile inside Ras Tanura and 200 yards offshore; the anchorage is completely sheltered, but the bottom is hard, and plenty of cable is necessary.

The channel inside the ras continues about 4 miles northwestward, passing close southward of an islet, and has 5 fathoms in places, but is narrow and tortuous. There is no fresh water near the anchorage.

Directions.—The approach to Ras Tanura anchorage from the eastward appears to be safe for vessels of 18 feet and less draft, and the best method is to steer for a position in lat. 26° 45′, long. 51° 00′; then steer 349° 22 miles, and direct to the ras, passing between Najwa and Khaura shoals, and using caution. Should the vessel be set to the southward, which is unlikely, the edge of the Fasht al Yarim will probably be visible from a considerable distance, but if not the rapidly decreasing soundings will indicate its vicinity. Round the ras (lat. 26° 38′, long. 50° 10′), which is steep-to, at a distance of 100 yards, and anchor as above directed. The reefs southward of the entrance can generally be seen.

From the results of a recent survey it appears that the best approach to Ras Tanura from the eastward is on or a little to the

northward of its parallel. The best water shown on the chart on this route is 3¾ fathoms.

Tides and tidal currents.—It appears to be high water, full and change, at Ras Tanura anchorage, about Vh. approximately, and the rise at springs may be about 7 feet. The tidal currents seem to divide and meet near the ras; the general west-going current turning southward to the southeastward of it, and turning northwestward to the northward of it, and a general east-going current setting northward to the southeastward of the ras, and southward to the northward of it, but neither current is strong enough to interfere with safe navigation. In the anchorage the current runs northwestward during the rising and southeastward during the ebb tide, at rates of 1½ knots at springs and ½ knot at neaps.

The times of the turn of the currents are not given; it is probable that the northwest going current continues some time after high water, and that the duration of each current is about 6 hours.

The general east-going current appears to set northeastward from Ras Tanura, passing between Fasht Bu Saafa and Al Ashira.

Fasht Bu Saafa (lat. 26° 58′, long. 50° 24′), 24 miles, 31°, from Ras Tanura, is a patch of large rocks on which the sea breaks heavily at times, there being 3 feet water on the shoalest part, and 3 fathoms about 1 mile to the southeastward; the shoal is 2½ miles in extent northwest and southeast, and does not always show in calm weather and at high water. The bottom around is sand, and there are depths of from 6 to 16 fathoms close-to.

A detached bank with 5 fathoms water lies about 3½ miles eastward of the shoal, and patches of 4½ and 4¼ fathoms within 4½ miles farther east-southeastward; there is a patch of 4¾ fathoms 4½ miles west-southwestward of Fasht Bu Saafa. Between these shoals and Al Ashira, to the southeastward, the depths are from 17 to 6 fathoms. The shoals are frequented by fishermen from Tarut Island, who take large quantities of fish with lines.

Al Ashira is a pearl bank some 8 miles in extent, with depths of from 3 to 10 fathoms, lying about 13 miles northward of Fasht al Yarim, and 11 miles south-southwestward of the 2-fathom rock south of Rennie shoal. Bu Amama, close eastward of Al Ashira, is a bank, about 7 miles long northeast and southwest, and 3½ miles broad, with from 8 to 10 fathoms water.

The coast from Ras Tanura to Ras al Mishaab, 125 miles northwestward, is low sand or stony desert, with a few isolated hills at intervals; it is fronted nearly the whole distance by extensive reefs, which in places have passages inside them, and there are several off-lying low islets. The water is not generally so clear as it is to the southward, owing to some of the bottom being white clay, and the

shoals in consequence do not show well. Many patches of whitish muddy color are often seen, apparently indicating shoal water, where no change in depth is found, yet the warning of discolored water must not be neglected. There are neither towns, villages, nor a fixed population on the coast from Ras Tanura until 60 miles northwestward of Mishaab, except the villages on Jazirat Janna and Musalamiya Island.

From Al Katif to Kuweit the country is called Al Adan; the only inhabitants are several Bedawin tribes, the principal of whom are Al 'Ajman, with whom have become incorporated the remnant of the once powerful Bani Khalid tribe. The Bani Hajir, a large tribe, occupies the district about 20 miles on each side of Al Katif, and Al Morra and Mukhatiba tribes are also located near that town.

The Great Pearl Bank decreases in width off the coast and may be said to end off Jazirat Abu Ali, although pearls are fished for on a small scale on some banks northward of that island. This part has been very incompletely surveyed.

Ras Abu Ali, the eastern extremity of Jazirat Abu Ali, bears 326° 48 miles from Ras Tanura. The desert coast between is sandy, with several low hills in places, and there are a few small shrubs on it.

Ras al Kaliya, on the coast, 16 miles northwestward of Ras Tanura, is a high sand hill; shoal water extends 4 miles off the point. About 4 miles northwestward of it and 1,400 yards inland is Faneitis (Jebel Dhalaifain) (lat. 26° 50′, long. 49° 53′), a rather remarkable square black rocky hillock.

Fasht al Eling, a patch about 2 miles in extent, with 1½ fathoms water, lies 13 miles east-northeastward of Ras al Kaliya. A patch, with 2¾ fathoms water, lies about 4½ miles, 80°, from Fasht al Eling.

The soundings between Fasht al Eling and the shoals off the land to the southwestward vary from 3½ to 5½ fathoms.

Jebel Khaweir, 15 miles northwestward of Ras al Kaliya, is a high sand hill on a slightly projecting point at the southern end of Dohat Abu Ali, which is large and shallow; inland of this point are some very high sand hills, and on the coast a few miles northward of it a small stony hill. Daka, 7 miles eastward of the point and in the fairway, is a patch almost dry.

Jazirat Abu Ali (Abu 'Ali), the eastern half of which is the northern side of Dohat Abu Ali, is 13 miles long east and west and lies northward of Ras Barabakh (Jazirat al Batinah), a point of the mainland 19 miles northwestward of Jebel Khaweir; there is a narrow shoal passage between the island and the mainland. A ruined tomb stands on a small hill close to Ras Abu Ali, and from the point a sand-spit, which dries, extends eastward about 4 miles. At low water thousands of cormorants settle on the spit.

There is good anchorage in a shamal southward of Ras Abu Ali, there being but little reef at the northern end of the bay southward of the eastern part of the island, but shoal water extends nearly 4 miles off the mainland.

In less than about 9 fathoms the bottom is hard sand; in greater depths it is mud; the soundings are pretty regular, from 18 fathoms in the middle of the channel between the shore and off-lying reefs to 6 and 4 fathoms close to the reef, and 7 fathoms within ½ mile of the spit off Ras Abu Ali.

The best position to anchor is in about 5 fathoms water, with the tomb bearing 0°, distant about 1 mile; within this the water shoals quickly to the reef, which extends about ½ mile from the shore. A small bight in the coast westward of the tomb affords complete shelter to the small native craft, but for larger vessels there is no shelter in this bay from the kaus, during which a heavy sea rolls into the bay. Anchorage, sheltered from the kaus, can, however, be obtained on the north side of the ras, in 4 fathoms, with the tomb bearing about 170°, distant about 3 miles.

In rounding the spit extending eastward from the island, give its eastern extremity a wide berth, as the water shoals very rapidly, and a heavy sea breaks on the weather side.

The Arabs say there are springs of fresh water, and date trees, in one or two places on the southwestern side of the Dohat Abu Ali.

Jazirat al Jiraida (Jaraid), charted 10 miles north-northeastward of Jebel Khaweir, but recently reported to be about 6 miles further eastward, is about ¼ of a mile in extent, sandy, and 12 feet high; it is covered with thin scrub, and is surrounded by a reef which extends ½ mile from its northern side, and has from 13 to 37 fathoms near it. The islet (lat. 27° 20′, long. 49° 49′), appears to be a breeding place of the cormorants.

Jazirat al Jinna (Jinnah) (Janáh), charted 9 miles, 72°, from Ras Abu Ali, but recently reported to be about 4 miles further eastward, is ½ mile long east and west, very narrow, 10 feet high, and sand covered with thin scrub. A small reef, which is steep-to, surrounds the islet and extends ¾ mile from its northern side. Fishermen dry and cure fish on the islet. Shelter can be obtained from shamals or kaus under the lee of the islet.

Shoals.—Between Jazirat al Jinna and Fasht Bu Saafa and Fasht al Eling with the shoals between them, 35 miles southeastward, is a large area but partially explored; it is known to be much encumbered with shoals, between which are depths of 20 or 30 fathoms, and great caution is necessary in standing within it.

The area between latitude 26° 59′ and latitude 27° 8′ and longitude 49° 54′ and longitude 50° 15′ must be avoided, as within it are numerous shoals, with depths of from 1 to 4½ fathoms.

Inshore passage.—From Ras Tanura to Ras al Ghar, between the mainland and the large and dangerous area just mentioned, there is a navigable channel; its southern end is wide, but the width soon decreases to 3 or 4 miles, with depths varying from 5 to 20 fathoms, and there is a 3½-fathom patch about 7 miles north-northeastward of Ras al Kaliya.

Janna Island (Jinnah) (lat. 27° 22′, long. 49° 20′), about 8 miles west-northwestward from the northwestern point of Jazirat Abu Ali, and 1,600 yards off the mainland, is about 1½ miles long northeast and southwest, ¾ mile broad, and some cliffs on its northeastern side are 35 feet high; the top of the island is level and its western part low; its color is light. There is a large fort with a circular tower to the northward on the top of the island, and a village on the northern side, inhabited by about 200 fishermen, with a large number of boats. Abundant fresh water is obtained from springs and is said to be good. The island and Musalamiya Island are under the Shaikh of Janna.

Dry sandbanks extend about 2 miles northward and 1 mile eastward of Janna. Just inside Ras Biddiya, a branch of the khur, with about 3 fathoms water, runs southward between Janna and the mainland; a small branch from this admits boats at high water to reach the village. There is a small basin, with 3 fathoms water, close northeastward of the island, and large boats lie in it; the entrance to the basin, from the eastward, dries.

The bay (Dohat ad Dafi), which extends about 15 miles southeastward of Janna, passing westward of Jazirat Abu Ali, is shallow and ends in a swamp. It appears to be frequented by black fish from 15 to 20 feet in length.

Ras Biddiya (al Bidya), about 2½ miles northward of Janna, is low sand, with tufts of grass. Dohat Musalamiya extends westward, probably about 7 miles, from Ras Biddiya. The entrance to this bay is about 400 yards wide between the ras and the reefs and sandbanks which extend northward from Janna Island, and are distinguishable even at high water; here there is a bar with about one fathom water, but within the bar there is a deep but somewhat tortuous khur leading nearly up to Musalamiya Island, and boats are able to get right up to the village on its eastern side at high water. The sandbanks and reefs in the bay are numerous and can generally be seen and are easily avoided. The mainland on the northern side of the bay is all low, but just southward of Musalamiya Island is a conspicuous cliffy bluff, and the coast southward of the bluff for some miles is from 50 to 80 feet high, with a growth of shrubs.

Musalamiya (Musallannyah) (Al Amair) Island, about 4 miles westward of Ras Biddiya, and at the head of the khur, is about 1 mile in extent, with low sand hills, on which is a small village situ-

ated amongst a few trees. The population of the village and surrounding district is said to be about 700, of which apparently not more than 200 were living in the village in March, 1913; these were all Arabs and negroes engaged in fishing, and a considerable number of boats were hauled up on the beach. A small quantity of water is obtainable on the island, but it is very brackish, and the natives say very unwholesome.

Directions.—To approach Janna, pass through the entrance to the khur, and follow the main khur west-southwestward until Janna village bears 180°; then steer for it, and keep close to the sand banks on the eastern side. For Musalamiya village, after passing through the entrance to the khur, keep in its main arm, and steer toward the conspicuous bluff southward of Musalamiya Island, and when close to the mainland turn toward the island.

Anchorage.—The best anchorage, when visiting Janna or Musalamiya, is about 5 miles northeastward of Janna Fort, in from 4 to 5 fathoms water; inshore of this position are extensive sand banks, with numerous ridges and reefs running north and south; the protection from shamals and kaus here is very slight.

In anchoring in this locality allow for a distance in the sea level due to the action of the winds, as well as for the usual fall of the tide; at a spot where 18 feet water was obtained after 12 hours of a strong kaus, there were only 14 feet on the following day, when a strong shamal had replaced the kaus and had been blowing for several hours.

The coast from Ras Biddiya trends northward and northwestward 9 miles to Ras al Ghar (Ghar); it is low, brownish, rocky hillocks overgrown with small shrubs, and there is but little shore reef.

Foul ground extends about 5 miles north-northeastward of Ras al Ghar, and continues, for distances up to about 16 miles, off the coast northwestward of Ras al Mishaab.

Fasht al Kash (lat. 27° 31′, long. 49° 32′) 60°, 12 miles from Ras Biddiya, extends about 5 miles northeastward, with a breadth of about 1¾ miles. Between Fasht al Kash and Jazirat al Jinna the waters are unexplored. The channel between it and the mainland has only been partially sounded; there are depths of about 4 to 6 fathoms for about 5 miles off the reef bordering the coast, but the depths near the fasht are unknown. This is the northern entrance to the channel leading past Jazirat Abu Ali to Ras Tanura.

Directions.—The channel from Ras al Ghar to Ras Tanura, in which 5 fathoms water could probably be carried, should only be taken in daylight, the vessel anchoring at sunset. Make either Jazirat Herkuz or Jazirat al Kran, and steer toward the land just

southeastward of Ras al Ghar. The soundings being very irregular are not much guide in the approach. When about 4 miles from the coast, steer southeastward toward Ras Abu Ali, the tomb near which is conspicuous, and give the end of the spit extending about 4 miles eastward from the ras a wide berth. Then steer to pass about 4 miles northeastward of Jebel Khaweir, and keep about that distance off the coast, avoiding Daka shoal, Give Ras al Kaliya a berth of at least 5 miles, to avoid the shoal extending off it, and also avoid the 3½ fathom patch about 7 miles north-northeastward of the ras. Pass southward of Fasht al Eling, and thence steer southward to Ras Tanura, using the chart as the guide.

Islands.—Jazirat Farsi, Arabi, Al Kran, Al Karaiyin, and Herkuz, all very low, and with deep water close to them, lie from 30 to 55 miles east-northeastward and northeastward from Ras al Ghar. These islets are difficult to make in the haze during and after a shamal, especially in summer, and should not be approached at night. The tidal current in the locality of the group sets westward, probably for 6 hours, ending some time after high water, and eastward for the next 6 hours, but the times of the turn of the currents are not known. There is no fresh water on either of them. Anchorage can be obtained southeastward of Al Kran, but is bad at all the other islands.

Jazirat Farsi, the northeastern islet, 55 miles, 61°, from Ras al Ghar, and 56 miles from the Persian coast, is ¼ mile in extent, 10 feet high, overgrown with coarse grass and brushwood, and on its northern end is a pyramidal beacon of loose stones about 12 feet high. The beach of the islet is white sand, and the fringing reef extends off about ¼ mile; it shows plainly, and has 25 fathoms close-to.

Flocks of small birds assemble on Farsi at certain seasons, and their noise may be heard on a quiet night from a distance of about 1 mile, sometimes even before the islet is seen. Turtle abound on Farsi, and they attract fishermen, chiefly from Kharag, who capture them for their oil and shell.

Beacon.—A wooden mark, 30 feet in height, surmounted by a circular iron top mark, 9 feet in diameter, has been erected on the summit of the southern part of the islet.

Jazirat Arabi (lat. 27° 47′, long. 50° 10′), 13 miles southward of Farsi, is a sand bank about 600 yards long east and west, with a rocky base, and 10 feet high; there is a small pile of stones in the middle. The fringing reef extends ¼ mile or less around, and is steep-to.

The islet literally swarms with birds, chiefly cormorants, and in the season is covered with their nests and young ones, so that it is scarcely possible to walk without treading on eggs. It has, or had,

a deposit of guano, a few inches thick, and is visited by turtle fishermen.

Beacon.—A wooden mark, 30 feet in height, surmounted by an iron 4-pointed star, 9 feet in diameter, has been erected on the summit of the southeastern extremity of the islet. There is a cairn about 6 feet in height on the northern end of the islet.

Tides and tidal currents.—It is high water, full and change, at Jazirat Arabi, at 6 h. 30 m. The currents between Jazirat Arabi and Farsi appear to attain a velocity of about 1 knot.

Jazirat al Kran (Karan), 31 miles, 71°, from Ras al Ghar, is nearly 1 mile long northeast and southwest, a few feet high, quite level, and covered with brushwood. Comparatively few birds were seen here. A fringing reef nearly surrounds the island, and extends about 1 mile to the northwestward, and about 800 yards to the southeastward; there are from 7 to 10 fathoms about ½ mile from the reef. The island is frequented by fishermen from Musalamiya, who dry fish, make turtle oil, etc., and dispose of their catch at Kuweit or Al Basra. Anchorage can be obtained on the southeastern side in 8 fathoms, sand, about ½ mile from the island.

Jazirat al Karaiyin (Kraiyin) (Kurain), about 3½ miles southward of Jazirat al Kran, is small, sandy, 2 feet high, and surrounded by a narrow reef, and generally covered with birds. A 5-fathom bank is said to exist about 8 miles eastward from the islet, but its position has not been determined, and the *Euphrates* passed over the assigned position with finding it.

There is a channel with 12 fathoms water between Jazirat al Karaiyin and Jazirat al Kran. The sea southward and westward, toward Jazirat al Jinna and Fasht al Kash, appears to be clear, but has been only partially examined, and caution is necessary in navigation here.

Jazirat Herkuz (Harkis) (lat. 27° 56′, long. 49° 42′), 15 miles, 330°, from Jazirat al Kran, is a sand bank about 200 yards long and 3 feet high, with a small fringing reef, which is steep-to, there being 15 fathoms close to it. But few birds were seen here. There are depths of from 14 to 17 fathoms within 5 miles eastward of the island, and thence to the islets just mentioned depths of from 20 to 30 fathoms, mud, and between it and Ras Bildani, 20 miles to the westward, 16 and 17 fathoms.

Beacon.—A wooden mark, 30 feet in height, surmounted by a circular iron topmark, 9 feet in diameter, has been erected on the center of the islet.

The coast from Ras al Ghar trends northwestward, with an inshore curve, 23 miles to Ras at Tanajib, and is generally low, with shoal banks extending from 5 to 9 miles off it. Jebel Munifa (Manifah), situated on the coast 12 miles west-northwestward of Ras al Ghar, is small, and near it is Dohat Balbul, small, and with anchor-

age for boats, where a kind of fair is held from April to June, when the Bedawin barter ghí for dates, rice, and other produce, brought by boat, from Kuweit, etc.

The 10-fathom curve is from 11 to 12 miles off this coast; between depths of 8 and 20 fathoms the bottom is generally white clay.

Ras at Tanajib (Tanájíb) rises steeply to a flat light-colored hill from 70 to 100 feet high.

The coast from Ras at Tanajib trends northwestward 7 miles to a point, between which and Ras Safaniya (as Safaniyah), a low projecting point, 8 miles farther northwestward, is a large bight; it is little known, but is low, with one or two small hills. The coast from Ras Safaniya trends northwestward 13 miles to Ras al Mishaab; Jebel Thaluf, 4 miles west-northwestward of Ras Safaniya, is a coast hill, about 40 feet high, showing two rises with a bluff on the north; and Jebel Amudi ('Amudah), 2½ miles southwestward of Ras al Mishaab, is a dark volcanic-looking hill, 105 feet high, which makes in four hummocks; the coast is otherwise all low.

Bildani Reefs extend from 15 to 16 miles off the coast for about 23 miles northwestward of Ras at Tanajib. Ras Bildani (lat. 27° 57′, long. 49° 14′), the southeastern extremity of the reefs, is 16 miles, 61° from Ras at Tanajib, and from it the edge of the reef, which appears to be continuous, trends northwestward 25 miles; it then turns southwestward 7 miles to Kassar al Mitma. Parts of the reefs are above water or dry, and there is a depth of 10 fathoms generally about ½ mile outside them. There is a boat channel along shore inside the reefs; it has not been examined, but the Arabs say it has enough water for a vessel.

Anchorage sheltered from a shamal, but open to a kaus, might be obtained under the lee of the reefs between Ras Bildani and Ras at Tanajib, with Tanajib Hill 260°, about 8 miles.

Shoal.—A patch, about 100 yards in extent, with 2¼ fathoms water, sand and rock bottom, and 12 to 13 fathoms around, lies about 5 miles northeastward of Bildani Reefs, with Ras at Tanajib bearing 212°, 22 miles; the water is but little discolored over the shoal.

Bildani Reefs should not be approached at night to less than 18 fathoms, nor by day, when in clear weather they can be seen from a distance of about 3 miles, to less than 15 fathoms; the land is not in sight from seaward of the reefs. The 2¼-fathom patch northeastward of the reefs should be given a wide berth.

Ras al Mishaab (Ras Misha' áb) is low and sandy, with patches of low cliff.

Jazirat al Mukta (Makta'), close southward of Ras al Mishaab, is about 2 miles long northeast and southwest, narrow, with cliffs from 20 to 30 feet high on its eastern side, and covered with

grass and brushwood. There is no channel inside it. A sandy spit, on which are several dry sand banks, projects 2½ miles eastward from the island. The shore reef, with 2 fathoms water, extends 4 miles north-northeastward from the island, and Kassar (Kasr) Umm as Sahal, near its outer edge, 3½ miles, 36°, from Ras al Mishaab, almost dries; there are depths of 9 fathoms close to this shoal.

Bandar Mishaab is the anchorage where native craft shelter from the shamal, on the southern side of the spit extending eastward from Jazirat al Mukta, and in the northwestern part of a large bay which is mostly shoal; the entrance, with from 6 to 7 fathoms water, is between Mukta Spit and Kassar al Mitma (Kasar al Mitma'), 2½ miles to the eastward. The best position is about 1½ miles southeastward of the northeastern point of Jazirat al Mukta. A detached shoal patch lies 1½ miles southward of Mukta Spit. The northern entrance to the inshore boat channel from Ras at Tanajib is in this bay.

Al Kumra (Kumrah), 18 miles northeastward of Ras al Mishaab, is a pearl bank with 8 fathoms water.

The coast from Ras al Mishaab (lat. 28° 12′, long. 48° 39′) trends north-northwestward 75 miles, to Ras al Arz, and it can be approached to a distance of 6 miles, but northward of Katat Araifiyan to 2 miles. The soundings are very little guide, there being much irregular ground within the off-lying islets. The bottom in less than 8 fathoms is sand or rock, but in greater depths mud.

There is no place of shelter on this coast, except for very small boats, from the shamal, which blows from north-northwestward, and sometimes from northward, causing a considerable sea.

The principal tribe between Mishaab and Shiaiba is Al Hawajir, consisting of about 1,500 men.

Tidal currents.—The tidal currents set north-northwest and south-southeast on the coast, and are strong.

The coast between Ras al Mishaab and Ras al Khafji, 14 miles north-northwestward, is low sand hills, and there are depths of 3 fathoms from 2 to 3 miles off it. Dohat al Asli, some 2 to 4 miles southward of Ras al Khafji, is shallow.

Ras al Khafji (Khafjí) is a sandy projection; on its northern side is a small khur. The shore reef extends 1 mile off it. The coast between Ras al Khafji and Ras Bardhalj, about 5 miles north-northwestward, falls back about 1 mile.

Breakers, apparently caused by a shoal, were reported in 1908 12 miles east-northeastward of Ras al Khafji.

Ras Bardhalj (Bardhalk) is low, white, and sandy, and a spit extends a mile northeastward from it. The coast from Ras Bardhalj turns westward about 3 miles, and then north-northwestward 14 miles to Ras az Zaur. Hadd al Hamara (Hamarah), 4½ miles northwest-

ward of Ras Bardhalj, is a small sandy spit under the lee of which boats shelter.

Jebel Banaya (Bannah), 10 miles northwestward of Ras Bardhalj and 2 miles inland, is from 70 to 100 feet high, saddle shaped, small, and dark colored, the coast being low white sand hills. About 2 miles northward of this hill is the entrance to a small khur, frequented by fishing boats.

Umm al Maradim, 14½ miles, 37°, from Ras Bardhalj, is a sand islet, about ½ mile in extent, some 20 feet high, and covered with brushwood; a reef extends nearly ½ mile off it except on the southern side, and there are from 14 to 16 fathoms water around. There is no water on the islet.

A small reef, awash and steep-to, lies 2 miles 331° from Umm al Maradim.

Depths.—There are depths of less than 10 fathoms for about 12 miles east-northeastward from the coast near Jebel Banaya, and a 9-fathom patch 9 miles north-northwestward of Umm al Maradim; thence to Jazirat Kubbar the surroundings are fairly regular, from 14 to 18 fathoms, except Taylor Rock, and decrease toward the 10-fathom curve, which is generally about 5 miles from the coast.

Jazirat Karu (lat. 28° 48′, long. 48° 48′), 10 miles, 39°, from Umm al Maradim, is about 200 yards in extent, 3 feet high, and sand, on which are a few tufts of grass. A spit extends ½ mile northward from the islet. The islet swarms with birds and is covered with their eggs and young in the season.

A small detached reef, steep-to, and on which the sea breaks at low water, lies 1¼ miles 341° from Jazirat Karu. The soundings are no guide in approaching the islet or reef, and neither should be neared at night.

Tidal currents.—In the vicinity of Jazirat Karu the current sets northwestward during the flood tide, and southeastward during the ebb tide, at a velocity of 1½ knots at springs; the times of the turn of the currents are not known, but are probably shortly after high water and 6 hours later.

Madura Reef (Madaira), 7 miles, 2°, from Jazirat Karu, is two coral patches extending 1,700 yards northwest and southeast, with a width of ¼ mile; there is a depth of 5 feet water on the northwestern and 3 feet on the southeastern patch, and from 10 to 20 fathoms around, but there is a depth of 9 fathoms about 1 mile to the southeastward; in fine weather the reef is only indicated by slight overfalls in its immediate vicinity, but in bad weather it probably breaks.

Ras az Zaur (Zor) is the extremity of a long low sandy projection; a spit extends 2 miles off it. Dohat az Zaur (Zark), between

Ras az Zaur and Ras al Kaliya, 10 miles northwestward, has many shoal patches, some 4 miles offshore.

Ras al Kaliya (Kaliyah) is low, and from it a spit, with 2 fathoms water near its outer end, extends northeastward 4 miles, to within a mile from the 10-fathom curve.

The coast from Ras al Kaliya trends north-northwestward, with a slight inshore curve, 30 miles to Ras al Arz, and is a low stony desert, brownish in color, but it rises gradually to the height of 200 or 300 feet a few miles inland. About 3 miles northwestward of Ras al Kaliya is a small square hill, some 50 feet high, resembling a fort in appearance, and along the coast to the northward are several forts and villages.

Katat (Kita'at) Araifiyan, 7 miles, 342°, from Ras al Kaliya, and about 4 miles from the shore, is a small detached reef, nearly awash at low water, with from 7 to 10 fathoms close around.

Taylor Rock.—A coral patch, 300 yards in extent, with 1½ fathoms water, lies 17 miles, 58°, from Ras al Kaliya, and 5 miles, 122°, from Jazirat Kubbar. There is no indication of the shoal in fine weather, but in bad weather it probably breaks.

Jazirat Kubbar (lat. 29° 05′, long. 48° 30′), 15½ miles, 40°, from Ras al Kaliya, is about 400 yards in extent, 8 feet high, and sand overgrown with brushwood; a fringing reef extends 300 yards southward, 600 yards eastward, and 200 yards northward from the island, and a narrow rocky tongue of foul ground, on which the sea breaks in heavy weather, extends 1,200 yards northwestward from it. A 1½-fathom patch lies 1,200 yards westward of the island.

Anchorage can be obtained in 11 fathoms ½ mile south-southeastward of the island, but there is no shelter during a shamal. In fine weather there is good landing on the southwestern side of the island.

A few birds frequent the island from the mainland. There is usually no water on the island, though there may be a little after rain.

Beacon.—A stone beacon, surmounted by a barrel, stands on the north side of Jazirat Kubbar.

Tidal currents.—The currents in the vicinity of Jazirat Kubbar set northwestward during the rising and southeastward during the ebb tide at a rate of 1 knot at springs, but the times of the turn of the currents are not known.

Shiaiba (Shi'aibah), 13 miles northwestward of Ras al Kaliya, is a small square fort on the coast; it is inhabited by about 40 families of the 'Ajman Tribe. The beach is sandy, but landing is indifferent at low water; there is a date plantation, and some wells; the people here are herdsmen and cultivators, as they are also at the small places to the northward.

Fahaheel (Fahaihil) is a small place 2¼ miles northward of Shiaiba, and Abu Halaifa (Halaifah) is a small fort about 5 miles northward of Shiaiba with a few date trees near it and some wells of good water. Horses are sometimes exported from Shiaiba to India. Al Fantas (Fantas), about 2½ miles northward of Abu Halaifa, is a small date grove. Abu Fatera (Fatairah) is about 2 miles northward of Al Fantas, and Fanailis (Fanaitis), 2 miles farther northward, is a small fort near the coast, with about 40 men. All these places are under the Shaikh of Kuweit.

Shoals.—A 1¼-fathom patch lies about ¾ mile offshore 7½ miles southward of Ras al Arz.

Kola Patch, on which the steamship *Kola* grounded in 1906, is situated 1,600 yards offshore, 3.6 miles southward of Ras al Arz; an examination found it to be a small rock with 1 fathom water, and 7 fathoms 150 yards around.

A shoal, ½ mile long north-northeast and south-southwest, and about 400 yards broad, with 2 fathoms least water, lies about 1,200 yards offshore, its northern end being 1.7 miles southward of Ras al Arz.

Ras al Arz (Ardh), the southern entrance point of Kuweit Harbor, is low and sandy; it is reported to have grown out considerably since the first survey in 1821–1829. Shoal water extends 400 yards northeastward from the ras. About 5 miles southwestward of the ras is Sirra (Sirrah) Hill Fort on ground 180 feet high; it is small, square, and a good mark. There is a very heavy sea on Ras al Arz during a kaus. A temporary light is shown at an elevation of 25 feet from Ras al Arz Beacon.

Beacon.—A black pyramidal beacon, 32 feet high, and surmounted by a black ball, stands on the extreme of Ras al Arz.

Tidal currents.—The currents off Ras al Arz are strong at springs.

Kuweit approach—Depths.—Between the shoal ground westward of Jazirat Kubbar and the vicinity of Katat Araifiyan (lat. 28° 59′, long. 48° 16′), there are depths of about 16 fathoms; northward of this line, the water shoals gradually toward the entrance to Kuweit Harbor.

Kuwait (Kuweit) Harbor is a bay, 20 miles long east and west and 10 miles broad, in the greater part of which there is anchorage, with good holding ground. In a shamal there is a considerable sea in the southern part of the bay, but not enough to distress a large vessel. The depths in the harbor are from 10 to 16 fathoms off Ras al Arz; from 5 to 9 fathoms off Ras al Ajuza; 4½ to 5 fathoms northeastward of Ras asheirij; and from 5½ to 6 fathoms in Dohat Kathama, shoaling to 4 fathoms near the narrows at its head.

The whole country around is a desert of white sand.

The bay between Ras al Arz and Ras al Ajuza, 5½ miles west-northwestward, is shallow, the shoals extending outward considerably beyond a line joining the points. A narrow bight, with from 7 to 11 fathoms water, extends 1½ miles west-southwestward on the northern side of Ras al Arz, and on the shore near its inner end is Dimna (Dimnah), a fishing village. On the shoal ground, 1,600 yards northwestward from Ras al Arz, is a patch with 3 feet water.

Ras al Ajuza (Ras 'Ajuzah) (lat. 29° 23′, long. 48° 00′) is low, and on it is a small, but conspicuous, square fort about 15 feet high; a rocky flat, which dries, with fish weirs on it, showing within 3 hours from low water, extends 700 yards off the ras; native boats anchor 2 miles southeastward of the ras, sheltered during a shamal.

The shore from Ras al Ajuza trends west-southwestward 9 miles to the head of Dohat Abu Tala. The town of Kuweit is on the shore southwestward of Ras al Ajuza. Shoal water extends about 1,600 yards off the town, and the beach dries out a considerable distance, but at high water the sea washes up to the houses; the native boats are hauled up on the beach, inside substantial breakwaters of loose stone. A short distance southwestward of the town are As Salaibikhat, some white sandhills.

Shoal.—A shoal, with 2¾ fathoms and less water, extends off the shore westward and southwestward of Ras al Ajuza, its northern extremity bearing 343°, distant 1½ miles from the ras. There are depths of 3¼ fathoms for about 1,200 yards eastward of the northern extreme of the shoal.

Buoy.—A black conical buoy is moored close off the northern extreme of the shoal.

Fasht al Hadeiba (Hadaibah), 2¼ miles, 312°, from Ras al Ajuza, is rocky, with 1¾ fathoms water; it is at the end of a spit, with from 1¾ to 2¼ fathoms water, extending about 2 miles east-northeastward from the northeastern part of Al Akkaz Reef.

Buoy.—A red conical buoy is moored on the eastern edge of Fasht al Hadeiba; a vessel of more than 10 feet draft must not pass over any part of the reef westward of the buoy.

Light.—A red fixed light is exhibited, at 58 feet above high water, from the flagstaff at the British Political Agency (lat. 29° 23′, long. 47° 59′), situated on the shore about 1.4 miles westward of Ras al Ajuza, and should be seen from a distance of 8 miles. The flagstaff is 88 feet high.

Anchorage buoy.—A conical buoy, painted black and white in horizontal stripes, is moored in 3½ fathoms nearly 2 miles west-northwestward from Ras al Ajuza. The depth quickly increases to 4½ fathoms northward of the buoy.

The three above mentioned buoys belong to and are maintained by the Government of India.

Anchorage.—Vessels of light or moderate draft anchor about 1¼ miles northward of the town, from about ¼ mile northeastward to ½ mile southwestward or westward of the anchorage buoy, in from 3½ to 4¾ fathoms. The farther westward the anchorage, the more shelter received during a shamal.

Vessels requiring deeper water anchor eastward of Fasht al Hadeiba in from 7 to 9 fathoms; here there is not much shelter from the kaus. In fine weather there is generally a light land wind in the morning, and fine easterly to southeasterly sea breezes in the afternoon.

Tides and tidal currents.—It is high water, full and change, at Kuweit, at 0 h. 13 m.; springs rise 11½ feet, neaps 8 feet. The tidal currents in the entrance, eastward of Fasht al Hadeiba, set about east-northeast and west-southwest and attain a velocity of from 2 to 3 knots at springs. The currents appear to set eastward from 1½ hours before until 4½ hours after high water, and westward from 4½ hours after high water until 1½ hours before the next high water, but they are much influenced by the winds.

Al Akkaz ('Akaz) reef extends from about 3½ miles, 284°, from Ras al Ajuza, 4 miles southwestward, with a breadth of about 2½ miles; the southern part of the reef, 2½ miles long and 1¼ miles broad, dries; the northern part has about 2 feet water with some rocky patches, which dry.

Jazirat Kurein, on the southern side of Al Akkaz Reef, and ½ mile off the southern shore of Dohat Abu Tala, is ¼ mile long north and south, 400 yards broad, with a peak 30 feet high at its southern extremity and barren; it is not conspicuous. Southeastward of the island is Bandar ash Shuwaik, a small basin, with from 4 to 2¾ fathoms water, mud, where small native boats lie completely sheltered. The channel to it passes eastward of Al Akkaz Reef, and has depths of 1½ fathoms, hard bottom, in places.

The shore of Dohat Abu Tala (Talah), which is low, curves westward about 5 miles from southward of Jazirat Kurein, and then turns northward about 4 miles to Ras Asheirij. Dohat Abu Tala is occupied by sand and mud flats, which dry.

Ras Asheirij ('Ashairij) (lat. 29° 23′, long. 47° 51), 8½ miles westward of Ras al Ajuza, is about 12 feet high; Jazirat Umman Namil, close eastward of the point, is nearly 1 mile long northeast and southwest, with a greatest breadth of ½ mile, 10 feet high, and rocky.

Beacon.—On the hill at the northwest part of Jazirat Umman a beacon, surmounted by an upright bisected triangle of 10-foot base, 51 feet above high water, has been erected.

A conspicuous building is situated about 400 yards northward of the beacon.

Buoy.—A conical buoy, painted black and white in vertical stripes, is moored in about 5 fathoms at 3.4 miles, 11°, from the beacon.

Dahat Kathama is the portion of Kuweit Harbor westward of Ras Asheirij. The shore, which is low sand covered with scrub, trends west-southwestward 8 miles from Ras Asheirij, and then turns northward and northeastward 4 miles to Ras Kathama.

The southern shore is bordered by sand or rocky shoals, on which are many fish traps, to the distance of about 1¼ miles, and the 3-fathom curve terminates about 1 mile east-southeastward of Ras Kathama.

Reefs.—Kutotain Ousherij (Kita'atain Ushairij), 1½ miles, 326°, from Ras Asheirij, is a small rock with 1¼ fathoms water; Kutat Abu Taleh, 1,800 yards farther west-southwestward, is a small reef, awash at low water, and there are small patches, with 3 and 5 feet water, respectively, about ½ mile and 1¼ miles west-southwestward of it. These reefs lie on or near the shoal water extending from the southern shore, and the 5-fathom curve passes close northward of them.

Ras Kathama (Kadhamah) is just above high water, and is swampy. About ½ mile inland from Ras Kathama and from the northwestern shore of Dohat Kathama, the ground is sandy and covered with scrub, gradually rising to the foot of a range of hills from 2½ to 3 miles inland, which attains a height of 410 feet northwestward of the head of the harbor.

Northeastward of the ras a soft mud flat extends from the shore, making landing very difficult at low water, and Fasht Oushair, with less than 6 feet water, lies 1.4 miles from that shore, 5 miles northeastward of Ras Kathama. With this exception the depth decreases gradually toward the mud flat on the northwestern side.

Anchorage.—The outer part of Dohat Kathama affords anchorage in from 5 to 6 fathoms for a large number of vessels. It is the only good anchorage for large vessels in the northern part of the Persian Gulf, and affords shelter in a shamal. To the eastward of Ras Asheirij a bank, with from about 4¼ to 5 fathoms and a breadth of from 1½ to 3 miles, extends northward across the bay.

The head of the harbor, westward of Ras Kathama, is shallow. The only landing place is at Khwesat, 1¾ miles west-southwestward from Ras Kathama; Fasht al Jather (Jathir), 1,600 yards southwestward of the ras, dries 11 feet, and there is a boat passage on either side leading to the landing place; the southern is known as Khur Rasdan. Jehara (Jahrah) (Jaharah) village lies about 1½ miles southwestward from the head of Dohat Kathama.

The northern shore of Kuweit Bay is low; it curves gradually round from the head of Dohat Kathama to a point about 2 miles southwestward of the entrance to Khur Sabiya, and situated about

12 miles north-northeastward of Ras al Arz. A mud flat extends some distance from the beach, which increases in width eastward to nearly 5 miles. Al Aghthi, the country inland, is probably from 200 to 300 feet in height, level on top, of a dusky brown color, and ending seaward abruptly in cliffs.

Tharub (Tharúb) is the great mud flat lying between Failaka and the mainland to the northwestward. Mashkan (Mashján), a sand islet, 1,200 yards long northwest and southeast, and about 10 feet high, lies on the flat, 2 miles northwestward of Failaka.

Failaka Island (Failakah) stands on an extensive flat of mud, sand, and rock, extending southeastward of Khur Sabiya; it is 7 miles long northwest and southeast, 3½ miles broad at its northwestern end, and very low; there is a clump of date palms on the southwest coast, about 2 miles from its southeastern end.

The highest part of the island is a little mound on its southern coast ½ mile eastward of its western point, which has a small tomb (lat. 29° 26′, long. 48° 16′) on it, 30 feet high, and a good mark. About the middle of the northwestern side is Az Zowar (Zor) Village, the only inhabited part of the island, with a small date grove, and about 200 families. Native boats anchor on the flat off the tomb, and shift round the point on which it stands, according to the wind. The island is unhealthy and water indifferent.

Extensive flats of mud, sand, and rock surround Failaka Island everywhere except on its western side, where, although there are only from 2 to 6 feet water, there is good landing for boats at all times of tide, especially at Az Zowar.

Uha or Auha (Auhah) Islet, 2 miles east-southeastward of the southeastern extremity of Failaka, is about 300 yards in extent, 8 feet high, and sand covered with scrub; on it are three cairns erected by Arabs, the northwestern and southeastern being about 6 feet high; the middle one is smaller.

Beacon.—A stone beacon, 11 feet high, surmounted by a wooden triangle on staff, 30 feet above high water, stands on the southeastern end of Uha Islet (lat. 29° 22′, long. 48° 26′).

Tides.—It is high water, full and change, at Uha Islet at 11 h. 50 m.; springs rise 11 feet, neaps 7½ feet.

Ras al Kahi (Yáhí), 3¼ miles eastward of the southeastern extremity of Failaka and at the extremity of the shoals extending from that island, is a rocky patch ½ mile long north-northeast and south-southwest, and 200 yards broad, which dries 2 feet. The water deepens to 5 fathoms 300 yards northeastward of the patch, and caution is necessary in its locality, as the lead gives no warning when approaching from the northward or eastward.

The water is shoal between Uha and Ras al Yahi, and also between them and Failaka.

Depths.—The 3-fathom curve from about 6 miles southwestward of the point southwestward of Khur Sabiya trends southeastward to about 9 miles southwestward of the southeastern extremity of Failaka, and then eastward 8 miles, when it turns north-northeastward to Ras al Yahi. The 5-fathom curve is generally about ½ mile outside the 3-fathom curve westward of Failaka, but closer in places; southward of Failaka the 5-fathom curve is about 4½ miles outside the 3-fathom curve, and from about 10 miles south-southeastward of Failaka it trends northward to ¾ mile eastward of Ras al Yahi.

Abu Jezza (Jazzah) is a large flat, with depths of from 6 to 9 fathoms, southeastward of the shoal water extending from Failaka.

Directions—Kuweit Harbor.—From the southeastward steer to pass about 10 miles northeastward of Madura Reef and continue about 8 miles northwestward into a depth of 10 fathoms. Then steer westward, keeping in depths of from 8 to 10 fathoms, but not deepening the water to more than 10 fathoms on the southern side of Abu Jezza Flat. In clear weather make Jazirat Kubbar, pass about 3 miles northward of it, and then steer west-northwestward toward Sirra hill fort. When about 4 miles from the land steer north-northwestward and pass 1½ miles northeastward of Ras al Arz; there is usually an indraft toward the ras. In hazy weather it might be well to continue westward with caution and make the mainland, which can be approached to 1½ miles.

From Shatt al Arab lightvessel steer about 196°, guarding against Palinurus Shoal, in 4½ fathoms least water, until well past Failaka Island, and then westward in 5 fathoms water; from the eastward steer for a position on Abu Jezza flat, and then westward, guided by the soundings. Sirra hill fort (lat. 29° 17′, long. 48° 2′) bearing 275° leads southward of Failaka Flat, in 3¾ fathoms water; possibly the clump of date trees on the southwestern side of Failaka might be sighted.

From 1½ miles northeastward of Ras al Arz steer to a position 1 mile east-northeastward of the black conical buoy off the extremity of the spit northward of Ras al Ajuza; then gradually turn, and pass on a southeast course between the black conical buoy and the red conical buoy off the eastern extremity of Fash al Hadeiba, and anchor as previously directed.

Should the buoys not be in position steer for the peak of Jazirat Kurein, bearing 227°, which leads midway between Fasht al Hadeiba and the shoal water off Ras al Ajuza. The bearing must be carefully maintained, as a deviation from it on either side of about 3° leads into shoal water.

Kuwait (Kuweit), one of the most important Persian Gulf towns, is situated on the shore from about ½ mile to 1 mile south-

westward of Ras al Ajuza; it is built on a considerable slope, the front houses being close down to the sea, while those behind are some 50 feet above it. There is a large suburb of mat huts outside the town proper. It is a nice looking place, the houses being principally of stone and sun-dried bricks. The population of the town is estimated at about 35,000, and of the territory about 89,000; the people are of various tribes, and a large number are Persians. There are generally one or two Bedawin camps near the town.

The natives are a united warlike tribe; Shaikh Mubarak, their ruler (1914), is influential and powerful. The town possesses more bagalas than any other port in the gulf, and sends about 400 boats to the pearl fishery.

The sandstone mound just westward of the town has a single-story house on it, the residence of the doctor attached to the American mission; the hospital lies between it and the water. There is a flagstaff without yard in front of the sheik's palace.

A British political agent is stationed at Kuweit.

Landing.—The best landing is under the British political agency; it is only available for very small boats at low water.

Trade.—Native sailing vessels, from 100 to 300 in number, and from 20 to 300 tons, belong to the place; they bring dates from Al Basra, and do much trade in the gulf. Horses are occasionally exported. Timber and rice are brought from India. Kuweit is much visited by the Bedawin, who bring horses, cattle, etc., to barter for dates, clothes, arms, etc.

Supplies.—Sheep can be procured; vegetables are scarce and indifferent in quality. The water in the district is unfit for drinking; water for the town is brought by tank boats from Shatt al Arab; from 3 to 5 days' notice is required. The coaling pier is a sloping hardway extending from the sheik's coal shed.

Communication.—The vessels of the British India Steam Navigation Co.'s subsidiary mail service between Bombay and Basra call at Kuweit weekly on their passage up the gulf and fortnightly on their passage down the gulf.

Jazirat Bubiyan (Búbiyan) is about 26 miles long north and south, 12 miles broad, low, barren, and partly covered with high water. Ras al Abreisha (Abraishah) (lat. 29° 33′, long. 48° 12′), its southern point, is 7 miles northwestward from Failaka Island. Khur Sabiya (Khor al Sabiyah), on its western side, is about ½ mile wide, and has from 2 to 10 fathoms water, but its southern approach over Tharub flat is very shallow, with several nearly dry patches. The flat of mud, sand, and rocks connecting Failaka and the mainland continues as a mud-flat northeastward about 3 miles off the southeastern coast of Bubiyan, and there is a depth of 3

fathoms and less within a distance of 6 miles from that side of the island.

Khur Sabiya.—Sabiya is a fortified mud inclosure on the west bank, at about 3 miles from the entrance to the Khur; it is surrounded by tamarisks, and has a few date palms. The well water is brackish.

Khur Abdalla ('Abdullah), between Bubiyan Island and the banks on the western side of the Shatt al Arab, is 13 miles wide at its entrance between Ras al Geit (Gait) (al Kaid), on the eastern coast of Bubiyan, on the southwest, and Ras al Bisha on the northeast, and it extends about 17 miles northwestward to the eastern end of Warba Island, where its width is about 2½ miles.

There is a conspicuous fort on Ras al Geit.

The channel to Umm Kasr is northward of Warba Island, and apparently carries a depth of 24 feet.

Warba Island (Warbah), northward of Bubiyan, and near the head of Khur Abdalla, is about 7 miles long east-northeast and west-southwest, and 2½ miles broad in the middle; it is separated from Bubiyan by Khur Sabiya, and from the mainland by the upper part of Khur Abdalla.

A sand bank, with from ½ to 2¼ fathoms water, extends nearly 1½ miles eastward from the island.

Both shores of Khur Abdalla are low alluvial land, covered in places with reeds and grass, and with shallow flats extending a long way off both sides, but much farther from the northern shore, and Marakat Abdalla, a shoal flat, stretches 12 miles southeastward from Ras al Bisha to the 3-fathom curve.

Umm Kasr, above Warba, is a fort about ½ mile inland. Plenty of good water is obtainable, but no other supplies. Abreast of fort there is very little water, even at high water, but at about 2 miles southward good anchorage is obtainable.

Fasht al aich (aik), about 6¾ miles, 103°, from Ras al Geit, is a detached bank, with 3 feet water, hard sand, and there are three separate patches, with 2¾ and 3 fathoms water, about 1½ miles outside it. Shoals, with from 1 to 3 fathoms water, extend about 4½ miles southeastward of Fasht al aich, and shoals, which dry in places, 7¼ miles northwestward of it. Khur al Geit, a 1½-fathom channel, lies inside the shoals.

There are two patches with 2¾ fathoms water about 3 miles southeastward and 5 miles east-southeastward of Fasht al aich.

Channel.—The channel of Khur Abdalla, trending west-northwestward, passes between Fasht al aich with the shoals off it, and the flats off Jazirat Bubiyan to the northwestward, on the southwest, and Marakat Abdalla on the northeast. Its width varies from about 4 miles to 1 mile between the 3-fathom curve, and depths

of 4 fathoms can be carried to about 3½ miles from Warba Island sand bank, and thence 3½ fathoms to the channels on either side of that island, but the southern of these channels is not recommended. The plan is the only guide.

Anchorage.—There is anchorage anywhere in Khur Abdalla above Ras al Geit (lat. 29° 47′, long. 48° 22′), but it is unadvisable to anchor below it.

For the Shatt al Arab and the coast to the eastward, see Chapter XI.

CHAPTER VII.

COASTS OF LAS BEILA (BELA) AND MAKRAN.

RAS MUARI TO GWADAR HEAD.

(Lat. 24° 50′, long. 66° 39′ to lat. 25° 7′, long. 62° 16′.)

The coast from Ras Muari to Gwadar Head, 230 miles to the westward, is chiefly an uninhabited desert, presenting a wilderness of hills and cliffs, with either swampy or arid clay plains. Water is everywhere bad and difficult to get, and but few supplies are obtainable at the villages.

Ras Muari (Muwari) (Cape Monze) (lat. 24° 50′, long. 66° 39′), 17 miles westward from Manora Point Lighthouse, on the western side of Karachi Harbor entrance (West Coast of India Pilot), is the western extremity of a sloping headland, which rises to a peak, 460 feet high, ¾ mile to the eastward. Lakki hills, a ridge with a nearly level top, on which are some remarkable hummocks, the highest being 776 feet high, extend northeastward from the ras, and turn gradually inland from about 3 miles eastward of it, the coast becoming low about 5 miles farther eastward.

Light.—A group flashing white light, elevated 150 feet above high water, visible 18 miles, is exhibited from a concrete tower, painted black and white in bands, on the low southwestern coast of Ras Muari headland, about 1 mile southeastward of Ras Muari. For arc of visibility see Light List and Charts.

Nancowry Shoal.—A ridge, with less than 10 fathoms water, extends 3 miles southwestward from Ras Muari Lighthouse, and on it, with the lighthouse bearing 45° 1.7 miles, is Nancowry shoal, with 4 fathoms water.

The 10-fathom curve is about ¾ mile, and the 5-fathom curve from 400 to 800 yards off the coast for 4 miles eastward of the ridge.

To pass southward of the shoals do not close Ras Muari to less than 4 miles, nor at night bring Manora Point Light eastward of 83°.

Soundings.—The bank, with less than 100 fathoms water, extends 53 miles southwestward, and 30 miles westward, from Ras Muari. The bottom is everywhere soft, except in less than 20 fathoms southwestward of the rás or in less than 10 fathoms eastward of it.

Sonmiyani Bay lies between Ras Muari and Ras Kuchar (lat. 25° 23′, long. 65° 45′), about 60 miles to the northwestward, and it extends about 23 miles northeastward. The shore, a succession of rocky points and small bays, trends northward 19 miles from Ras Muari, and then turns northwestward 27 miles, becoming sandy with sandhills and covered with small jungle; it then so continues westward to the Hara Hills. Pab Mountains commence about 5 miles northeastward of the northern entrance point to the Hab River, and trend northeastward and northward, increasing gradually in height to upward of 3,000 feet; westward of them is a plain, 35 miles broad, extending to the Hara Hills. This plain is drained by the Pur Ali River, which enters the sea at Sonmiyani. Hara Hills trend north-northeastward from the northern shore of the bay, and their height is estimated at 1,500 feet; they are of light color and irregular outline. The town of Beila (Bela), the capital of the State of Las Beila, stands in the valley, distant 65 statute miles by road northward from Sonmiyani.

Soundings.—Northward of Ras Muari the 10-fathom curve is about 3 miles, and off Sonmiyani about 9 miles, from the shore; the soundings decrease regularly to 4 fathoms close to Sonmiyani Bar and within 1 mile of the shore eastward of it. The water deepens regularly to seaward.

Shoal.—A small patch, with 3 fathoms water, lies 1,400 yards 245° from Ras Muari; the ground is foul between the ras and the patch.

Beauchamp Reef, 3½ miles 270° from Ras Muari, is a coral patch with 5 fathoms water, and foul ground, with from 7 to 9 fathoms water, extends ½ mile south-southeastward and 1 mile north-northwestward from it.

The shore.—Just northward of Ras Muari is a small sandy bay and beach, inside which is a valley between the Lakki Ridge and some detached hills, 560 feet high, with cliffs along their sea faces, which extend to the left bank of Hab River. Foul ground extends nearly a mile offshore for 1¾ miles northward of Ras Muari. A few fishermen are generally here in the fine season.

Hab River rises in the mountains northward of the Pab Range, and, after a course of over 150 miles, falls into the sea 3½ miles north-northeastward of Ras Muari. There is no fresh water within several miles of its mouth, except during freshets. The rocky hills on its southern side end about 1 mile within the mouth, after which there is a plain on each side of the river, called the valley of the Hab. The northern side of the entrance is low, and a sandy spit extends nearly across the channel. A small isolated rocky hill stands on the northern side, a little inland.

The channel of the Hab River is tidal and nearly dries; it has 9 feet at high water, and there are generally breakers across the en-

trance; it is only used by fishing boats. The channel outside high-water mark shifts, but is practicable for a ship's boat. The tidal influence does no extend more than about 2 miles inside the mouth.

The locality off the mouth of the Hab appears to have been but partially examined.

Churna Island, 4 miles north-northwestward of Ras Muari, is about 1,200 yards long northwest and southeast, 600 yards broad, and 580 feet high, with almost precipitous light-colored hills; from the southward it shows a peak, and from the westward a flat-topped hill, sloping northwestward and southeastward; it is steep-to, barren, uninhabited, and has no water.

There is anchorage in 5 fathoms, sand, 400 yards offshore, with the highest part of the island bearing 225°.

There are depths of from 5 to 11 fathoms for 2½ miles southeastward and eastward of the island. For 6 miles southwestward of the island the soundings are irregular and the bottom rocky.

The shore from the northern entrance point of the Hab River trends northward 3½ miles, and is low; it then continues northward, with an easterly bend, 5 miles to Chir Churna (lat. 25° 01′, long. 66° 41′), a detached square rocky hill, about 100 feet high, joined to the mainland by a low sandy isthmus.

Shoals.—A patch, with 1¾ fathoms water, lies 1½ miles 285° from the northern entrance point of the Hab River. A 3-fathom patch lies 1½ miles northward of the point 3½ miles northward of the northern entrance point of the Hab River, and there is a sunken rock 1½ miles farther northward; there are from 4 to 6 fathoms around both the patch and the rock.

Islet.—A low rocky islet lies ¾ mile northwestward of Chir Churna; there is a depth of 7 fathoms close seaward of it, and of 5 fathoms between it and the land. The 10-fathom curve trends from about ½ mile northwestward of Churna Island to 2 miles westward of the islet.

The shore.—North-northeastward of and within 8 miles from Chir Churna are three small bays separated by high rocky points. Inland of the southernmost of these bays are backwaters, one of which has an entrance close eastward of Chir Churna; from these backwaters, the ground rises abruptly to the southern part of the Pab range. The shore, about 8 miles north-northeastward of Chir Churna, turns northwestward, and at the distance of 15 miles is the entrance to Sonmiyani Harbor; it is hilly for the first 3 miles, and thence to the harbor is sand hillocks covered with tufts of grass and small bushes.

Sonmiyani (Sonmiani), the seaport of Beila, is a small town with a population of 3,200, standing on the northeastern shore of

the Miani hor, an extensive backwater, which receives a number of large creeks, and through which flows the Pur Ali River. Scarcely any craft larger than fishing boats belong to the place, and the trade is in the hands of a few Banyans settled here, who farm the customs from the Jam of Beila. The town is difficult to make out from seaward, owing to its low position and dull appearance. The water is bad, and hardly any supplies are obtainable. The only exports are salt fish, fish maws, and mustard seed.

Depths.—The entrance to Sonmiyani Harbor (lat. 25° 20′, long. 66° 33′) is nearly 2 miles wide, and on the bar there is a depth of 1¼ fathoms, but the channel inside it, with from 3¼ to 6 fathoms water. close to the eastern bank, has a width of about 300 yards. A great shoal flat, on which the sea breaks heavily, extends nearly 2½ miles outside the entrance, and the entrance channel winds through it; there are 4 fathoms water close to the outer edge of the shoal.

The eastern point is sandy hillocks, thinly covered with tamarisk bushes, and between it and the town is a mud-flat, which mostly dries, over which the Vindar River, flowing southwestward, discharges during floods. The western entrance point is low bare sandhills The town, which lies north-northeastward from the anchorage inside the bar, can be seen from between the points.

The channel trends northward from the eastern entrance point, passes about 2 miles westward of the town, and, becoming very narrow, turns northeastward in two shallow branchees to the northeastern shore, whence it continues northwestward to a bar, which dries, 3 miles northwestward of the town. The branches are used by native craft to get nearer to the town.

Formerly, about 2 miles within the eastern entrance point, the main channel turned westward about 18 miles inside the shore sandhills, nearly to the eastern and lesser Hara Mountains. This country has not been surveyed, but it appears now to be a vast swamp. During heavy rains, the Pur Ali (Porali) River flows into the swamp, but usually the waters of the river are entirely absorbed in irrigation, it being dammed about 20 miles inland. The western shore of Sonmiyani backwater is low, and partly overflowed at high water.

Directions.—The breakers on the projecting shoal are the best mark for approaching the harbor, but if the water be smooth, do not decrease the depth to less than 5 fathoms. If the weather is clear, Churna Island bearing 173° astern leads to the bar, and in thick weather, from the southward, a departure can be taken from the island. There are generally fishing boats about, either entering or leaving the harbor.

European vessels never enter the harbor; the largest native craft, about 30 tons, lie about a mile from the town. Even for a boat going inside, it is advisable to take a local fisherman as pilot.

To communicate, anchor off the bar in 5 fathoms, and about 8 miles from the town.

Tides and tidal currents.—It is high water, full and change, at Sonmiyani Harbor at about 9 h. 0 m.; springs rise 9 feet. The tidal current sets eastward during the flood tide in the offing on the northern shore of Sonmiyani Bay, but turns southward on the eastern shore, following the curve of the land, and the current during the falling tide takes probably the reverse directions; the currents are weak.

The shore of Sonmiyani Bay, from the western entrance point of Sonmiyani Harbor, trends west-northwestward 10 miles, and then turns westward 33 miles to Ras Kuchar; it is low with sand-hillocks, on which are tufts of grass, to the lesser Hara Mountains, a distance of about 24 miles, when it again is low to Darya cham, 13 miles farther westward. The soundings are regular, and the shore can be approached to 6 fathoms, the 3-fathom curve being from 1 to 2 miles offshore.

The land between the Hara Mountains and Ras Malan (lat. 25° 19′, long. 65° 13′), about 48 miles westward, appears from seaward a succession of rugged mountains, generally of light color, with lower whitish clay peaks, called "shur" by the natives. Jabal Hinglaj, 20 miles west-northwestward of Ras Kuchar, and 8 miles inland, is 3,500 feet high, and quoin shaped, Gorangati, 8 miles further west-northwestward, with a valley between, is a conspicuous square-topped mountain, 3,800 feet high, resembling a castle with bastions, its sides appearing almost vertical. From Jabal Hinglaj, the main branch of Jabal Hara, of irregular outline and with lower hills in front, trends east-northeastward from 8 to 12 miles inland, until 5 miles from the lesser Hara mountains, when it turns north-northeastward, parallel with the latter.

Pur River entrance is about 33 miles westward of the western entrance point of Sonmiyani Harbor; it is a small salt-water creek, which, during the rains, drains the valley between the two Hara ranges. The shore from Pur river to Ras Kuchar, 10 miles westward, forms a slight bay.

Darya cham (Dáriyocham), the eastern of a group of low hills, is situated 2 miles inland, and is several white conical hillocks, the highest of which is about 300 feet high.

Anchorage could be obtained in about 5 fathoms in the bay westward of Par river, but a depth of 3½ fathoms is charted about 2½ miles off-shore, south-southwestward of Darya Cham.

Ras Kuchar (Kuchari) (Kuchri) (lat. 25° 23′, long. 65° 45′) is the southeastern point of a range of low cliffs extending along the shore, which rises to the detached group of low hills.

The coast westward of Ras Kuchar is low; Jabal Ghurab (Gurab), near the beach and 2½ miles from the point, is small and oblong. A shoal bank extends 2½ miles from the shore southward of it, with 6 fathoms close to.

Darya Cham, Ras Kuchar hills, and Jabal Ghurab are situated near the middle of the southern part of a plain extending from the Hara mountains to Jabal Hab.

Jezirat Chahardak (Chahardam), on the coast 4 miles westward of Jabal Ghurab, are some rocks from 20 to 30 feet high, and somewhat higher than the coast. There is a good landing for a boat inside them. From the rocks the coast is low 10 miles westward to Jabal Hab, a little westward of which a ridge of low hills comes down to the sea.

Hingor River (Hingol), the entrance to which is 1 mile eastward of Jabal Hab, can be entered by small craft of 6 feet draft at high water. Fresh water is always obtainable in the river, though at some distance from the sea. The river is generally nearly dry; it winds close round the eastern side of Jabal Hinglaj, and through a gap in Jabal Hab; it has a course of about 140 miles from the interior, and brings down quantities of driftwood during freshets. Eastward of the river, the plain inside the coast sand hills is swampy after rain. There is a well of good water near the sea on the eastern side of Jabal Hab.

The coast from Jabal Hab westward, about 12 miles, to the cliffs of Ras Malan is low with sandhills.

Anchorage can be obtained in the bay eastward of Ras Malan in 4 fathoms water, with Gorangati bearing about 0°, and the ras 230° about 1 mile offshore, but the water appears to shoal close inshore of this position.

Ras Malan (lat. 25° 19′, long. 65° 13′), about 14 miles west-southwestward of Jabal Hab, is prominent and presents a steep bluff, with a level top of clay, capped with impure limestone; the highest part, about 4 miles northward of the ras, is 2,050 feet high, to which the cliffs rise abruptly with no beach. Great masses of clay, detached from the mountains, frequently fall. The ras from seaward appears a long, light-colored tableland ending in cliffs; between it and Jabal Hinglaj is a confused mass of lower hills and shur. There is a depth of 4 fathoms about 1 mile off the ras. There are no native inhabitants anywhere in the locality, and water cannot be procured.

Soundings.—The 10-fathom curve is about 6 miles off Ras Kuchar, 9 miles off Jabal Hab, and 4 miles off Ras Malan, and the 100-fathom curve is 24 miles southward of Ras Kuchar, and 11 miles southward of Ras Malan.

The coast is cliffs for 19 miles westward of Ras Malan; it then is low and sandy about 15 miles farther westward to Ormara Isthmus, with a plain inland. The high land westward of Ras Malan, known at Batt (Bat-h) Mountain, is divided 7 miles from the ras by the Khur Batt, a great watercourse and gorge running through the mountains, and having a salt water lagoon with a sandy bar between it and the sea. The mountain becomes lower westward of the khur.

The plain westward of Batt mountain extends some 10 miles inland to the Tallu (Taloi) hills, a range running nearly parallel with the coast in several ridges eastward to Gorangati. On this plain, northward of the eastern point of Ras Ormara, and 4 miles from the sea, is Chandra kup, a conspicuous white cone about 600 feet high, with a mud crater.

Khur Maniji (Mannaiji), 20 miles westward of Ras Malan and about 1 mile westward of Batt mountain, is shallow, but for a short time after rains becomes the mouth of a small river. Khur Gurad, about 5 miles farther westward, is similar; both are visited by native boats.

Soundings.—The 10-fathom curve is about 8 miles southward of Khur Maniji, and the 100-fathom curve is 9 miles southward of Khur Batt.

Ras Ormara (Ormárah), a mountainous peninsula, is 7½ miles long east and west, 2 miles broad, and 1,400 feet high; the top slopes gently eastward and southward, and ends on all sides in cliffs. The peninsula appears wedge shaped from the southward. It is of similar geological formation to the other ranges on the coast, and is only accessible with great difficulty. The sandy isthmus connecting the middle of the peninsula (lat. 25° 11′, long. 64° 37′) to the main projects about 5 miles southward from the coast, is nearly 1½ miles wide, and on its southern part is Ormara Village. Northward of the village, there are high sand hills in the middle of the isthmus, but the beach on each side is low.

Ormara Village, on the eastern beach of the isthmus, about 1 mile from the cliffs, is filthy, absolutely reeking of decayed fish; it is a few stone houses and mosques, and about 100 mat huts, with a population of about 3,000, chiefly fishermen. A few hundred wandering herdsmen, belonging to the village, are scattered over the neighboring territory. There is a little inland traffic with the Kolwa district. The people own many fishing boats, besides a few small dangis, which trade to Maskat, Karachi, and the coast of India with salt, salt fish, pish, grain, gihi, etc.; a few Banyans are settled here.

Telegraph.—There is a telegraph office on the isthmus about a mile westward of the village, where messages are received for all parts.

Supplies.—Water is indifferent and scanty, and is obtained from wells near the telegraph office; a few sheep and fowls may be procured, also excellent fish from any of the numerous canoes or fishing craft.

Ormara East Bay, called by the natives Demi Zar, is the general anchorage for vessels visiting the place. It has sandy bottom, except near the cliffs, and is shallow off the village, from which the anchorage, in 3½ fathoms, is distant 2½ miles. The eastern point of the ras, about 500 feet high, bears from this anchorage 171°, and the telegraph office about 261°. The water shoals regularly when standing into the bay, and the eastern bluff point may be approached to ½ mile. The beach dries a long way off the village, making landing inconvenient at low water; a shoal extends from the northern side of the cliffs.

The bay is open to easterly winds, which blow strongly at times from December to February. During the southwest monsoon there generally occurs at least one blow from the eastward, with rain, which is not of long duration; West Bay is then the best anchorage, though communication with the shore is more tedious. Native craft appear always to ride out these breezes. In the southwest monsoon, and any time after April, a long swell begins to set round the point into East Bay, causing a surf on the beach and vessels at anchor to roll heavily.

Tidal currents.—The tidal current sets northward and eastward round the bay during the flood tide, and westward and southward during the falling tide; the currents are weak.

Ormara West Bay, called by the natives Padi Zar, is nearly 8 miles across its entrance between the western extremity of the ras (lat. 25° 10′, long. 65° 33′), and the high cliffs of Ras Sakani (Saik-hani) to the west-northwestward; the shores are low and sandy; at its head, and about 5 miles from the village, is a small rocky hill near the shore. The bay is seldom visited, being open southwestward and westward. Shoal water of less than 3 fathoms extends 3 miles off the eastern and northern shores of the bay, and the anchorage is with the western extremity of the ras bearing about 180°.

Soundings.—There are 6 fathoms water close to the cliffs on the southern coast of Ras Ormara, and 20 fathoms 7 miles distant; the 100-fathom curve is about 2 miles further seaward.

The coast from Ras Sakani trends west-northwestward 20 miles to Khur Kalmat, and between Ras Sakani and Ras Basul, a distance

of about 10 miles, it is continuous cliffs, about 800 feet high, of light color and irregular outline, without any marked peak. The cliffs are the sea face of the Kamgar Hills, between which and the Tallu Range is a wide plain. There are 3 fathoms about 1 mile from these cliffs, and the 10-fathom curve is distant 8 miles.

The Talar Hills trend east-northeastward from about 10 miles northwestward of the entrance to Khur Kalmat, and approach the western part of the Tallu Hills.

Ras Basul (Basól) is the western point of the cliffs. The bay between Ras Basul and Khur Kalmat is shallow, the 3-fathom curve being nearly 5 miles from its low sandy shore, which probably can hardly be seen at that distance.

About 2 miles northwestward of Ras Basul is the mouth of Basul River, a large watercourse rising in the mountains of the Kolwa district and flowing from the interior between the Tallu and Talar ranges. The land about its mouth is swampy and very low.

Khur Kalmat is the largest khur on the coast, having 5 and 6 fathoms inside, with considerable width, but the bar has 2 feet water. The entrance is rendered difficult by rocks lying upward of 1 mile outside the bar, and the tidal currents in the entrance are strong. The land near the entrance is very low, with mangrove swamps. Native craft of 9 feet draft are said to enter the khur by the eastern of the two channels over the bar. Inside the bar there are depths of from 4 to 7 fathoms. At some distance inside the khur is joined by four creeks, which, beyond the range of the tides, are watercourses. Near the mouth of the khur are a few huts with fishing boats, and 3 miles up an old tower on the western bank with some date trees.

The only permanent habitations are a cluster of seven houses, known as Tarr, on the western bank, which contain 28 people, and in the country around are about 900 Sangurs and 100 Kalmatis.

The water supply at Tarr is scanty and very brackish.

There is a small trade, the exports consisting of dwarf palm in its raw state, lime, and mangrove wood, and the imports of piece goods and food grains.

The coast for 12 miles westward of Khur Kalmat is low, with shoal water about 3 miles off it; it then continues 18 miles westward, gradually becoming higher with a number of shur hills, when it turns southward 6 miles to Ras Jaddi. Until near the village of Pasni, about 3 miles northwestward of Ras Jaddi, it is barren, but two small watercourses, generally dry, fall into the bay, one 18 miles, the other 22 miles, westward of Khur Kalmat, and there is a small boat harbor about 3 miles westward of the western watercourse.

The 3-fathom curve is from 2 to 3 miles off the shore for 18 miles eastward of Pasni.

Astola Island, known to the Baloch as Haptalar, to the Meds as Astalu, to the Arabs as Astalo, and to the Hindus as Satadip, and situated 16 miles southwestward of the western entrance point of Khur Kalmat, is about 3 miles long east and west, ½ mile broad, and without water; it is table topped with cliffs all around, and there is a partly detached hill (lat. 25° 6′, long. 63° 50′) at its western end, 260 feet high, which is a little higher than the rest of the island. The cliffs rise vertically from the sea, except on the northern side, where, about the middle, is a little sandy point, and at the northwestern corner a sandy spit and a small boat harbor. There are rocky ledges off both ends and some detached rocks above water along the southern coast, but all are less than 400 yards from the cliffs.

Sail rock (Gurab of the local fishermen), 1,400 yards southward of the middle of the south side of Astola, is small, 20 feet high, steep-to, and appears like a boat under sail; vessels should not pass between the rock and the island.

Two shoals, each about 1,400 yards in extent, with 1½ fathoms water, lie close together with their outer edge 1½ miles northward from Astola Island; the western shoal is connected by a bank to the island and the eastern shoal nearly so; their northern side is steep-to, and there is no passage between them and the shore except for boats. A shoal, with 2½ fathoms water, lies 1.9 miles northeastward from the eastern end of the island, and is steep-to; a patch, with 2¼ fathoms water, lies between it and the island.

Astola Island is covered with a luxuriant growth of rank grass and low shrubs, and abounds with small venomous snakes, called "garr" by the natives. The Arabs from Maskat frequent the place for turtle catching, and Pasni fishermen for gwahtag fishing, the latter being an excellent fish which abounds there. They also visit the island to collect sea-birds' eggs, which are found in enormous quantities on the cliffs at the end of the cold weather.

The island is held in extremity veneration by the Hindus, and pilgrims from all parts visit it in small but increasing numbers; on the southeast side of the top of the island is a small open shrine made of rough stones. The Pasni Meds hold several places in the island sacred, and on a detached rock at the northwestern extremity are said to be the footprints of Duldul, the horse of Ali; on the beach close to this rock is an inclosure dressed with red flags and dedicated to the Khwaja Khizr, the patron of the Meds. Here the Meds are wont to take omens at the beginning of each fishing season.

The landing place generally used by pilgrims is at the northeast point of the island; the ascent from it is steep and tortuous, and after heavy rain it sometimes becomes impassable, when the ascent and descent have to be effected by the aid of ropes.

Channel.—The mainland to the northward of Astola is very low and shoals extend 4 miles off it, leaving a clear channel about 7 miles wide between these shoals and those northward of Astola, with from 5 to 8 fathoms water, sand, rock, and shell; depths of 4 fathoms are charted for about 8 miles southward of the coast just westward of Khur Kalmat. The depth between Astola and Ras Jaddi varies from 7 to 10 fathoms, but there are 4 fathoms 2 miles off the ras, and a detached 5-fathom rocky patch 7½ miles 104° from it.

To proceed through the channel, which should not be taken at night, except under favorable conditions, pass 4 miles from the island to avoid the outlying shoals, on which vessels have grounded when attempting to pass them closely.

Webb Bank (lat. 25° 02′, long. 63° 53′), which was discovered when the telegraph cable was being laid in 1864, and named after the engineer in charge, is a rocky patch about 2 miles long east and west and 1 mile broad; its eastern end is situated about 5 miles south-southeastward from the eastern end of Astola. A depth of 3½ fathoms has been obtained on the bank, but there may be less water; the sea breaks on the bank in the southwest monsoon.

The channel between Sail Rock and Webb Bank is 2¾ miles wide, and apparently clear, but the bottom is uneven, and there is said to be a depth of 5 fathoms, rock bottom, in places. The 20-fathom curve passes ¾ mile southward of the bank; caution is necessary in passing it, especially at night, when it should be given a wide berth.

Shadi Khur is a river which breaks through the hills northward of Pasni, and ends in a large shallow creek with swampy banks; its mouth is 2 miles northeastward of the town, where it has formed a projecting point, with dry banks extending 1,200 yards off-shore. About 1 mile up the khur there are ruins and other remains denoting the site of a large ancient town, which is said to be the rich and beautiful city of Pesani, burnt by the Portuguese in 1581. Boats can enter the khur (lat. 25° 17′, long. 63° 29′) at high water.

Pasni Town, on the low western shore of the bay northward of Ras Jaddi, has, since 1905, come into considerable prominence owing to its proximity to Turbat, the headquarters of the Makran administration, about 70 miles north-northwestward. It has 306 houses and a population of about 1,500. The majority of the people are Meds fishermen, but a few Kalmatis, Sangurs, Hindus, and Lotiahs also reside here. It is the headquarters of the Naib of Kolanch and of the Kalmatis. A small fort, two mosques built by the Meds, and a bungalow in which the post and telegraph office is located are the only permanent buildings, the rest of the town being mat huts. It is the seaport of Kolanch (Kulanch), a district of Makran, extending about 120 miles westward of Kalmat.

There is no vegetation near except a few date trees to the southward; southwestward of the town is a mass of high white sandhills, and, northward of these, a number of shur hills.

Anchorage.—The depth in Pasni Bay is 5 fathoms and less. There is anchorage in 3½ fathoms, sand, about 1½ miles from the shore, with the town bearing 270°, and Ras Jaddi about 194°, or farther off in 4 fathoms. There is considerable surf after April, when it is difficult to land.

Supplies.—The water here is not good; no provisions can be obtained except fish, and occasionally a few sheep and fowls.

Communication.—The vessels of the British India Steam Navigation Co's. subsidiary mail service between Bombay and Basra, call at Pasni fortnightly, both ways. There is a bridle path from Pasni to Turbat and Panjshir. There is postal and telegraphic communication.

Trade.—Most of the trade of Makran has now gravitated to Pasni; it is chiefly in the hands of Hindus and Lotiahs or Khojahs. The chief exports are wool, ghi, cotton, dates, and mats, and the imports piece goods, grain, and miscellaneous articles. The only industries are fishing and fish curing, and 125 boats belong to the port.

Ras Jaddi (lat. 25° 13′, long. 63° 30′) is a small projection from which a rocky spit extends ½ mile, with 4 fathoms water close off it.

Between Ras Jaddi and the southeastern point of Jabal Zarrain, 1½ miles to the southward, is a small bay; a cluster of clay hills of fantastic shape, about 150 feet high, rises 300 yards inland from the shore.

Jabal Zarrain, the southern extremity of Pasni Bay, is about 400 feet high, brown in color, conspicuous, and of barn shape, especially on easterly or westerly bearings. On northerly bearings it appears a long notched ridge with sloping ends, and, from a distance, isolated, the land around being low. It rises abruptly, and at a distance of about 1 mile is a depth of from 4 to 5 fathoms.

The 10-fathom curve is 7 miles, and the 20-fathom curve 10 miles southward from it; thence, the water deepens to the 100-fathom curve about 5 miles farther southward.

The coast trends westward 10 miles from Jabal Zarrain, and then curves round from northwest to southwest, 13 miles, to Ras Shamal bandar; it is low, and shoal water extends about 1½ miles off the western 13 miles. Chakuli Kuh, a range of mountains about 1,400 feet high, continues westward from the Talar hills parallel to the coast, from 9 to 12 miles inland.

The coast appears desert, but a little distance inland it is fertile in places, producing corn and cotton.

Soundings.—The 10-fathom curve is about 7 miles southward of Ras Shamal bandar, and the 100-fathom curve is about 16 miles south-southeastward of the ras, where it is close seaward of the 20-fathom curve. In over 5 fathoms water the bottom is generally mud, with patches of rock up to 12 fathoms.

Ras Shamal bandar is the end of a long jagged ridge of precipitous white clay hills, close to the sea, with low ground at the back, which extends 19 miles westward to Ras Kapar, and is from 400 to 500 feet high. There is no beach on the coast except in a few places at low water. The ras is a bluff, and is the first high land near the sea westward of Zarrain; it should not be approached to less than 6 fathoms water, as a reef projects 1 mile around it, off which the water deepens quickly.

The bay eastward of the ras is shallow near the shore, but used by fishing boats and small vessels sheltering from westerly winds.

Ras Shahid, 5½ miles west-southwestward of Ras Shamal bandar, is the southern extremity of the clay hills; there is a depth of 4 fathoms about 1 mile off it. There are three gaps in the clay hills between 6 and 9 miles westward of Ras Shahid; Sawur River flows through one of these gaps, and into the sea by a large salt-water creek.

Ras Kapar is the southern extremity of a table-topped hill nearly 800 feet high, with bluff ends, at the western end of and partly detached from the hills extending from Ras Shamal bandar; it projects but little. There are 3 fathoms water 600 yards from the ras. Kapar, a small village, is near the ras, and close to the sea.

The coast from Ras Kapar trends westward 15 miles to a little shallow bay on the southern side of which is Jabal Sar; it is sandy, and rises to low hills, principally "shur." From about 11 miles north-northeastward of Ras Kapar, the Kuh Chilari, which is separated from the Chakuli kuh by the Sawur River Valley, extends westward and is continued westward by the Kuh Daram (i Dramb). Mukh, the summit of the latter range, situated about 17 miles northwestward of Ras Kapar, is a conspicuous peak 3,200 feet high, and Barn Peak, 5 miles eastward of it, is 3,152 feet high. Lower clay hills rise in front of these mountains.

Kuh Dimak, 6 miles westward of Ras Kapar, and a short distance inland, is small, of darker color than the other hills in the locality, and has several little paps on the summit.

Khur Barambab (Karwat River), about 9 miles westward of Ras Kapar, is small; it is the eastern boundary of the Gwadar territory. Shoal water extends from ½ mile to 1 mile off the coast between Ras Kapar and Sar.

Sar, or Jabal Sar (Ras Sur) (lat. 25° 13′, long. 62° 28′), the northeastern point of Gwadar Bay, is a small, quoin-shaped white

clay hill, 560 feet high, with a vertical cliff facing eastward and rising steeply; the isthmus connecting it to the mainland is low and sandy.

Gwadar Bay (East Bay, or Demi zar).—The shore of Gwadar Bay from Sar trends west-southwestward and southward 12 miles to Gwadar Promontory, and is low and sandy; it then trends eastward 2½ miles to Ras Nuh. The bay is generally shallow, a flat of about 2 fathoms extending from 1¼ to 2 miles eastward from the isthmus. The deepest water is off Sar and Jabal Mahdi, and the 5-fathom line from Ras Nuh trends toward the highest peak of Jabal Mahdi; westward of this line the water shoals regularly toward the flat, with sand bottom.

The bay is well sheltered from southwesterly winds, but in the southwest monsoon the long low swell rounding Ras Nuh causes vessels to roll heavily. During easterly winds communication with the shore is sometimes difficult, but these winds are rarely strong enough to endanger a vessel; a steamer at such a time might enter West Bay.

Jabal Mahdi (i Mahdi), on the northern side of the bay, about 2 miles westward of Sar, the land between being low, is a precipitous white clay ridge about 4 miles long east and west, with vertical cliffs on its southern side, which rises abruptly from the plain. Its outline is very remarkable. The highest peak (lat. 25° 12′, long. 62° 25′), 1,375 feet high, is a sugar-loaf at the eastern end of the ridge; Asses Ears, 2 miles to the westward, is a curious double peak, 1,360 feet high. From the eastward the ridge, and also Sar and Gwadar Head, appear isolated.

The Kuh Daram range from about 13 miles northward of Sar decreases in height to the westward, and ends suddenly in the two Garr (Gar), great vertical steps, 1,550 feet high, which are situated about 20 miles west-northwestward of Sar, and are good marks. A wide plain extends from the foot of Kuh Daram to Jabal Mahdi, and from the Garr to the sea. In this plain are some scattered villages, and much cultivation.

Northward of the Kuh Daram range are the peaks of Kuh Saiji, 3,260 feet high, part of a range extending east and west about 20 miles inland.

Gwadar Head is a rocky peninsula, the eastern extremity of which, Ras Nuh, bears 214°, distant 8½ miles from Sar; it is 7 miles long east and west, about 1 mile broad, and connected with the mainland by a low sandy isthmus 800 yards broad, on which stands Gwadar town, and on either side of which are Gwadar and West Bays. The headland is surrounded by cliffs, and slopes down from the highest bluff of 480 feet, which rises southward of the west coast of the isthmus.

Ras Nuh (lat. 25° 06′, long. 62° 23′), the eastern point of the headland, is a bluff 280 feet high, and on it stands a single tree, close to the cliff; it is conspicuous on westerly bearings, and, with its high white bluffs, appears like a quoinshaped island, but on northerly and northeasterly bearings it is not so noticeable, and appears a darker color against the land behind.

Bandar Hairan, ¾ mile southwestward of Ras Nuh, is a small bay, where the cliffs are low and the beach sand, frequented by fishing boats.

Ras Kamiti, the western point of the headland, is a cliff about 70 feet high. A small white tomb on the southern edge of the cliff, about ½ mile eastward of Ras Kamiti, is conspicuous on northerly bearings when the sun is shining on it.

Soundings.--The 10-fathom curve passes about 1½ miles eastward of Ras Nuh, and the same distance southward of Gwadar Head, and the 20-fathom curve trends from 3 miles southward of Ras Nuh to 7 miles southward of Ras Kamiti; the 100-fathom curve is about 7½ miles southward of Ras Nuh. In less than 10 fathoms the bottom is hard in places, but in greater depths it is mud.

Spit.—A shoal rocky spit extends about 1,800 yards southward from a low rocky point about ¼ mile southward of Ras Nuh; there is a depth of 4 fathoms on its outer end, and from 6 to 10 fathoms close outside.

The eastern peak of Jabal Madhi bearing 5° leads about 1 mile eastward of the spit, and the southern extremity of Gwadar head, 285°, about 1 mile southward of it. From the westward do not shoal the water to less than 12 fathoms until Ras Nuh bears 350°, when steer north-northeastward until eastward of the ras. There is generally a ripple over the spit, and the sea breaks on it during the southwest monsoon. There is a depth of 5 fathoms 600 yards eastward of Ras Nuh.

Boat harbor.—On the northern side of the head, 1½ miles westward of Ras Nuh, there is a projecting cliffy point, within which is a small harbor where native vessels are laid up and boats shelter.

Tides.—It is high water, full and change, in Gwadar Bay at about 9h. 30m.; springs rise 8½ feet. The tidal currents are hardly perceptible; off the head the current sets eastward during the flood, and westward during the ebb, tide.

Directions.—From the eastward keep in depths of from 10 to 15 fathoms, for even if hazy it would scarcely be possible to pass the head without seeing it.

From the westward, in hazy weather, when nearing Gwadar Head, keep in depths of from 12 to 15 fathoms, which are about 2 miles southward of it, to avoid the spit off Ras Nuh. In approaching the head from the southward attention is necessary to the currents and

the position should be frequently obtained. When the whole of Jabal Madhi Ridge is open eastward of Ras Nuh, about 348° steer for the eastern peak of the ridge, and when off Ras Nuh turn northward until the telegraph office, a large block of buildings northward of the town, bears 262°. Anchor with the telegraph office bearing between 262° and 250°, as close in as the depth permits, both to facilitate communication with the town and to obtain smooth water.

If not bound to Gwadar, do not decrease the depth below 20 fathoms when passing Gwadar Head in hazy weather.

At night, especially, keep a good lookout for fishing boats and canoes with their nets. A vessel's blue light should be answered from the telegraph office, and a lantern hoisted on the flagstaff there.

Gwadar, until recently the principal town and port on the Makran coast, is situated on the sandy isthmus northward of Gwadar Head. It is a dirty place, and it is advisable for visitors to sleep on board their ships, as fever is prevalent amongst Europeans here. Most of the dwellings are mat huts, but a number of mud and stone houses, amongst which the Khojah mosque is conspicuous, are clustered round a square fort with a high tower. There are a few date and banyan trees. The town (lat. 25° 07′, long. 62° 19′) and district are under an Arab Wali of the Sultan of Maskat. The population was about 4,350 in 1903; the people are chiefly Meds, but the trade is carried on by Khojahs and Hindus. About 23 large native craft and 646 fishing boats belonged to the port in 1905.

There are no jetties nor any convenience for landing goods, but native boats can be hired.

Communication.—The vessels of the British India Steam Navigation Co.'s subsidiary mail service between Bombay and Basra call at Gwadar fortnightly, both on the passage to and from the Persian Gulf. There is a British Indian post and telegraph office, which is situated in a building belonging to the Indo-European telegraph department, northward of the town.

Supplies.—A few sheep are obtainable and also a small quantity of onions and potatoes. Rice, ghi, and other articles of native food can be procured; fish is abundant and good. Water of indifferent quality and in small quantity is obtainable from wells or by digging about 12 feet deep. There is no coal.

Trade.—The trade of Gwadar has declined since 1905; the principal exports were ghi, wool, goat's hair, hides, cotton, salt fish, fins, dates, pish leaves, and mats, and the imports cotton piece goods, silk, sugar, rice, iron, juari, and kerosene.

CHAPTER VIII.

COAST OF MAKRAN.

GWADAR HEAD TO RAS AL KUH.

(Lat. 25° 07′, long. 62° 16′, to lat. 25° 47′, long. 57° 19′.)

The coast between Gwadar and Ras al Kuh is low in places, with ranges of mountains some distance inland, but there are many high rocky points and hills near the sea. The country, though barren, is not absolutely desert. There are several villages or settlements, but no town of importance, and the population is scanty.

Navigation on this coast in the period of the southwest monsoon is much embarrassed by the land being constantly obscured by haze, and the only guide is the lead. When about 5 miles offshore, and in less than 10 fathoms water, it is often necessary to obtain the position by observations of the sun.

The haze appears to begin about the end of April. In the northeast monsoon the weather is generally clear.

Gwadar West Bay (Padi zar), the entrance to which is between Ras Kamiti (lat. 25° 6′, long. 62° 15′) and Ras Pishkan, 9½ miles to the westward, is somewhat semicircular in shape, and extends northward about 8 miles. Shoal water extends about ½ mile southwestward from Ras Kamiti, but the northwestern extremity of the ras is steep-to; there are less than 3 fathoms nearly 2½ miles westward from Gwadar Isthmus. The isthmus, on which is the town, is the eastern shore of the bay, and thence the shore curves around northward and westward, continuing low to Kuh Tuzhdan, a small ridge of low hills on the shore northward of Ras Pishkan. A fort held and built by Gwadar Arabs in modern times stands near Kuh Tuzhdan. Khur Ankara, at the head of the bay, and 12 miles from Gwadar, is small; near it the land is marshy. The shore of the bay trends westward and southward, and south-southeastward from Kuh Tuzhdan to Ras Pishkan, and within about 2½ miles from the ras are three little bays separated by two rocky points; shoal water extends 2 miles off all the western shore. Garr Mountain, northward of the middle of the bay, is conspicuous.

Ras Pishkan (Píshukán) (lat. 25° 05′, long. 62° 05′) is narrow, rocky cliffs about 20 feet hight; a rocky spit, on which the sea breaks, extends 700 yards east-southeastward from it. There is a small vil-

lage (Pishukan) northward of the ras. Ras Pishkan is said to be the western limit of the Gwadar territory, but it is not settled.

Soundings.—The 10-fathom curve passes 1½ miles outside Ras Kamiti and 2½ miles outside Ras Pishkan. There are 8 fathoms water in the entrance to Gwadar West Bay, whence the depth decreases gradually toward the shoals extending from the shores.

Anchorage.—There is anchorage 2¾ miles offshore in 4 fathoms, sand, with Ras Kamiti bearing 198° and the telegraph office 90°; and, on the western side of the bay in 4 fathoms, with Ras Pishkan bearing 182° 3 miles.

The coast from Ras Pishkan trends westward about 12 miles, and is low; it then turns southward 4 miles, to Ras Gunz, and is a succession of rocky points of cliff with sand beaches between. Bandar Gunz (Ganz) is the bay thus formed; shoal water extends about 1 mile off its shores. Small vessels shelter in the bay in 3 to 4 fathoms, about 1 mile offshore, in westerly winds.

Ganz village, near the shore, about 4 miles northward of Ras Gunz, has 82 mat huts, and a population of about 400 (Méds). A small whitewashed mosque is the only permanent building.

Ras Gunz (Ganz), the bluff eastern point of Katagar, is of light color, and about 200 feet high; it is conspicuous from the westward, but not from the eastward.

The coast of Katagar, a promontory about 454 feet high, trends westward from Ras Gunz 7½ miles to Ras Jiyuni, and is an almost unbroken line of cliffs, here and there fronted by a sandy beach. Ras Garnan, 2 miles eastward of Ras Jiyuni, is about 20 feet high, and projects ½ mile southward beyond the line of the higher cliffs.

Singular hills rise a short distance inland, having rugged peaks and pillars of clay; they extend nearly to the Dasht River, and northward of them is the great plain or valley of the Dasht.

Soundings—Shoals.—The 10-fathom curve passes within 1 mile of Ras Gunz, and runs nearly parallel with the Katagar coast. Outside this the water deepens regularly to the 100-fathom curve, which is 12 miles from the shore, but in less than 10 fathoms the bottom is very uneven and a 6-fathom patch was discovered 3½ miles southeastward of Ras Jiyuni by the British naval vessel *Sphinx*, in October, 1891.

A shoal, with 2½ fathoms water, rock and sand, lies about 1½ miles southeastward of Ras Jiyuni; it is of considerable extent east and west and there is a depth of 7 fathoms between it and the shore.

Ras Jiyuni (Jinwri) (lat. 25° 00′, long. 61° 42′), the eastern entrance point of Gwatar Bay, is a cliff about 100 feet high. A spit appears to dry about 200 yards off its western part.

Gwatar Bay, the entrance to which is between Ras Jiyuni and Ras Fasta, 16 miles westward, extends about 8 miles to the northward.

The eastern shore of the bay is cliffs for about 3½ miles northward of Ras Jiyuni, after which it is sand with rocky hills a short distance from the beach; the head of the bay is low, with several khurs and mangrove swamps extending some miles inland; the western shore is a succession of bluff points and sandy beaches rising to table hills.

The hills near the eastern shore are of even outline, but a little farther back they are of fantastic shapes, and a remarkable pillar, one of the highest, is very conspicuous. Kuh Darabul, northward of the middle of the bay, and 9 miles inland, is a detached table-topped hill about 500 feet high, with sloping sides. On the northwestern shore of the bay are several bluffs and points which terminate southward of Gwatar Village; a low plain extends inland from the hills.

Depths.—The depths in the bay are reported to be considerably less than those shown on the chart. The difference is slight off Gwatar Village, but considerable off Jiunri.

Shoal.—A 2-fathom patch, with 6 fathoms water close northward and southward, lies 1 mile 276° from the northwestern part of Ras Jiyuni, and a reef extends about ½ mile off the shore for 2½ miles northward of this part of the ras.

Ras Fasta, the end of a detached ridge extending 6 miles westward along the coast, is a cliff 45 feet high, northward of which is a small bay, with from about 3 to 1½ fathoms water, mud bottom, resorted to by native craft for shelter; Castle Hill, 3½ miles northwestward from the ras, is square, rocky, and 430 feet high; its top, seen over the lower hills in front, resembles a fort.

South Islet and North Islet, 1 mile eastward of Ras Fasta, are two small rocks situated close together on a reef about 400 yards in extent, off which foul ground extends 800 yards; the higher islet is 108 feet high. There is said to be a channel with 4 fathoms water between the islets and the ras.

The depths in the bay are regular, with mud bottom, decreasing from 6 fathoms at the entrance to 3 fathoms 1¼ miles off the head. The 5-fathom curve is about ¾ mile off the shore westward of Jiunri Village, and the 3-fathom curve is about ½ mile off the western shore of the bay and Gwatar Village.

Khur Dasht.—The entrance to this river lies about 5 miles westward of Khur Jiyuni, and on either side of it are low sandy shores on which the sea breaks during the southwest monsoon. The bar and breakers extend 1 mile southward from the shore.

The passage over the bar is on the eastern side of the breakers, and a depth of 4 feet at low water can be obtained by keeping a sandhill covered with grass, situated near the shore on the western side of the river entrance in range with the third distant peak to the westward of Kuh Darabul range, bearing 338°.

Course should not be altered up the river until the sandy spit on the east bank is well clear of eastern extreme of Kuh Darabul. For the first two miles the river consists of two channels close to the banks. The eastern bank of the river should be followed.

At from 10 to 11 miles from the entrance there is a caravan ford where the depth is only 2 feet, with a rise of from 2 to 3 feet. No villages or natives were observed until near the ford.

Rivers.—Khur Jiyuni is the eastern creek at the head of Gwatar Bay; about 2 miles westward of it is Khur Dasht, the mouth of the Dasht River, the largest river on this coast, running westward and southwestward from its source eastward of Panjshir through Dasht and the valley of Kej, and finally passing eastward of Kuh Darabul and entering the sea in the bay. The mouth of the river is about 400 yards wide, and flat sandy banks almost level with the sea. When the river is in flood the depth for 4 miles up is from 2 to 3½ fathoms in the deepest places, and the width decreases to 100 yards; it is tidal for about 12 miles.

The western large khur (Chil River), which enters the bay close to Qwatar village, is the mouth of two combined currents; it has a shallow bar, but is deep inside, and is tidal for some distance. After rain, the water is fresh some miles up the river. There are other small khurs around the head of the bay between the two described.

Tides.—It is high water, full and change, in Gwatar Bay at 9 h. 30m.; springs rise 8½ feet.

Jiunri Village (Jinwri) consists of two villages of mat huts, situated on low rocky cliffs on the eastern shore of Gwatar Bay, about 2½ miles northward of the ras, and a third village on the ras, with a population of about 450 (Meds).

Gwatar Village (lat. 25° 09′, long. 61° 29′), some 200 to 300 mat huts, is situated near the khur above mentioned, where the inhabitants, mostly fishermen, keep their boats. Scarcely anything can be obtained either here or at Jiunri, and there is very little trade of any kind.

Gwatar Flat.—There is a remarkable flat outside Gwatar Bay, which is a useful guide at night or in thick weather; the 10-fathom curve is 10 miles, the 20-fathom curve 17 miles, and the 100-fathom curve 19 miles, south-southeastward of Ras Fasta. The bottom is of white clay, very tenacious and gritty. The evenness of the flat and of the bottom in the bay are probably due to silt brought down by the Dasht and other rivers. After heavy rain the water over the whole flat becomes discolored, and much driftwood is seen.

The coast from Ras Fasta trends west-northwestward 15 miles to Ras Bris; for about 6 miles from Ras Fasta it is cliffs; then there is a gap of about 2 miles with a low shore, where the beach falls back a little, and for the remaining 7 miles it is vertical level white cliffs

about 200 feet high. Shoal water commences off the shore about 3 miles westward of Ras Fasta and increases in width to about 1 mile off Ras Bris.

Shoal.—A patch, with 4¼ fathoms water, lies 1½ miles 218° from Ras Fasta.

Ras Bris (lat. 25° 08′, long. 61° 10′) is the western extremity of the white cliffs. Northeastward of Ras Bris, and detached from the sea cliffs is a range of high white clay hills with very remarkable peaks. The ras, with the jagged range behind, is remarkable.

The coast turns north-northeastward 2 miles from Ras Bris and then westward 32 miles to Chahbar Point. In the bay northward of Ras Bris is Bris, a small fishing village. Anchorage has been obtained in 5 fathoms sand in the middle of the bay, from which the water shoals gradually to the shore.

The northern shore of Bris Bay is low and sandy, and thence the coast continues low to Siya (Siyah) Kuh, about 1,000 feet high, dark, round, and close to the sea, with cliffs to seaward, which lies 18 miles westward from Ras Bris. The 5-fathom curve from Ras Bris to about 3 miles from Siya Kuh appears to be about 1½ miles offshore, but 6 fathoms have been obtained ½ mile off Ras Bris.

Kochu, a village 11 miles westward of Bris, now consists of only four huts. There is a large village on the coast 1½ miles east-southeastward of Siya Kuh.

Kinj (Kinj Dap) River is a small water course issuing through a gap in the coast hills westward of Siya Kuh, where there are a few date trees; it is probably usually completely blocked by sand, but heavy rains in the interior open it at intervals. Westward of the river are rocky hills, with cliffs, gradually decreasing in height toward Chahbar Point. Inland of these coast hills is a vast plain extending many miles westward.

Mountains.—Khaki (Kaki) Kuh, northeastward of Siya Kuh and 9 miles inland, is 2,030 feet high. The range extends some miles and presents a vertical face southward; it has a deeply indented outline and from the westward shows a double peak, with a bluff to the southeastward; being white clay it shows clearly when the sun shines on it. The high land near the eastern side of Chahbar Bay, with cliffs nearly 1,000 feet high at the northern end, is detached from other hills.

Soundings.—The 10-fathom curve is about 3 miles, the 20-fathom curve 8 miles, and the 100-fathom curve 12 miles south-southwestward of Ras Bris. Southward of Siya Kuh, the 10-fathom curve is 1½ miles, the 20-fathom curve 4 miles, and the 100-fathom curve 8 miles offshore. The 10-fathom curve is 1 mile, the 20-fthom curve 2½ miles, and the 100-fathom curve 10 miles southward of Chahbar Point. In depths greater than 10 fathoms the bottom is mud.

Chahbar Point (lat. 25° 17′, long. 60° 36′) is low and rocky, with small sand hills, and on it is a small square tomb with a white dome. A reef extends westward 600 yards, and foul ground 200 yards farther, from the point.

Chahbar Bay, the entrance to which is between Chahbar Point and Ras Kuhlab, 7½ miles to the westward, extends northward 10 miles. The shores on both side are rocky, with cliffs in places until about 4 miles inside the entrance; the remainder is low and swampy. A range of mountains runs parallel with the coast 8 miles inland; one of its summits is the conspicuous Quoin Peak, 2,400 feet high, situated 20 miles 344° from Chahbar Point, and, about 10 miles 284° from Quoin Peak, is a sharp spiked peak, which is noticeable on northeasterly bearings.

The telegraph station, a yellow building, stands on a sand hill to the southward of the town. A large white mosque, which is conspicuous, stands at the northern end of the town. The post office is in the telegraph station.

Depths.—There is a depth of 8 fathoms, sand and shells, in the entrance to Chahbar Bay, and the depth decreases regularly to 5 fathoms 5½ miles to the northward, whence it gradually shoals to the head of the bay. A rocky bank, with 1½ to 2 fathoms water, extends 3 miles northwestward from Tiz Point. There are depths of 3 fathoms generally about 2 miles off the northern and western shores of the bay, northward of the 270-foot cliff.

The shore from Chahbar Point trends northeastward 1 mile and then turns northward and north-northwestward 3½ miles to Tiz Point, forming a small bay, at the head of which stands Chahbar town.

The southern side of this small bay is partly bordered by a reef, and is shoal with foul bottom for ¼ mile from the shore, northeastward to a small clump of date trees near where there is a fort in ruins. Northward of these trees the beach is sand.

About ¾ mile northeastward of Chahbar town is a high tableland, the southeastern side of which is 840 feet high, and almost precipitous in places. The shore of the bay from above 1½ miles northward of the town to Tiz Point is cliffs 150 feet high, rising steeply to the tableland. The cliffs turn inland northeastward of Tiz Point, and become the southern side of a large valley, on the northern side of which higher hills trend eastward and leave the shore of the bay low and swampy.

In the valley northward of Tiz Point, about 1 mile from the sea, is Tiz Village, a mud fort with a few huts, a few trees, and some cultivation. At the entrance to the valley is a small hill, on which is a fort, and, fronting it, a shallow lagoon, which is entered by fishing boats at high water. From Tiz the shore is low and swampy around

the head of the bay. Khur Namak, 6 miles from Tiz, becomes a small river after rain.

Ras Kuhlab, the eastern end of Kuhlab Promontory, is low cliffs; there is a depth of 3 fathoms 400 yards, and of 5 fathoms ¾ mile, eastward of it; from the ras the cliffs increase in height, and trend northwestward 2 miles and northeastward 1 mile to a cliffy point 270 feet high; the cliffs then trend westward 2 miles, when the shore turns northward and northeastward to the head of the bay, and is low. Kunarak Village is situated on the western shore of the bay about 2¾ miles northwestward of the 270-foot cliff; there is a conspicuous tree southward of the village. There is a small village on the cliffs southward of the 270-foot cliff, but it is not visible from seaward.

Light.—A fixed white light, elevated 10 feet above high water, visible 5 miles, is exhibited from the roof of the telegraph office at Chahbar. For the arc of visibility, see Light list and chart.

Anchorage.—There is anchorage off the town in about 4 fathoms, sand, with the tomb on Chahbar Point bearing 170°, and the mosque 110°; native vessels anchor in 2 fathoms about ½ mile offshore. During the southwest monsoon, when a heavy south-southeasterly swell has been rolling into the bay, sheltered anchorage, with no swell, has been obtained about 2.1 miles, 32°, from the 270-foot cliff on the western side of the bay. There is good anchorage on the western side of the bay during a shamal.

Prohibited anchorage.—In order to avoid fouling the telegraph cable, vessels are prohibited from anchoring to the southward of a line drawn 270° from the large white mosque.

Tides and tidal currents.—It is high water, full and change, in Shahbar Bay at 9 h. 30 m.; springs rise 9 feet. The tidal currents in the bay are scarcely perceptible.

Directions.—The two entrance points, being of light color, are not easily distinguished at night, and the 20-fathom curve is distant about 2 miles from them, but the light on the telegraph office is a guide; approach must be made with caution. Pass not less than 1,400 yards westward of Chahbar Point to avoid the spit off it.

Chahbar Town.—Chahbar was taken from the Baluchis by the Arabs at the end of the eighteenth century, and held by them until dispossessed in 1872 by the Persians. The town, with Tiz Village, has been made over to a tributary local chief by the Persians. The telegraph station (lat. 25° 17′, long. 60° 37′) is a fine building about ½ mile southward of the town; it can be seen from the southeastward. There is a garrison, and barracks consisting of three large one-storied buildings near the telegraph station. The chief officer of customs is in charge of the place. The population is about

3,000, chiefly Baluchis, who are mostly fishermen, or employed in native dhows by which the small trade of the place is carried on. There are no roads and no trade with inland towns.

Near the town are gardens with many fruit trees and a few date palms, extending ½ mile inland. At a short distance northeastward of the town is a mosque with a white dome, conspicuous from seaward.

Climate.—Northwesterly and northeasterly winds prevail at Chahbar, but during the southwest monsoon in the Indian Ocean south-southeasterly winds of some strength are common by day, but fall light at night. These winds cause a heavy sea to break all round the shores of the bay, except at the town, which is sheltered. Shamals are fairly frequent in winter. The prevalence of south-southeasterly winds renders Chahbar much more suitable to European than almost any other place in, or near, the entrance to the Persian Gulf.

Trade.—The trade of Chahbar is insignificant. The exports are ghi, moong, fins, pish leaves and seeds, mats, wool, goats' hair, hides, gelatine, and barley; and the imports are cotton piece goods, rice, juári, sugar, etc.

Supplies.—Water is scarce and brackish. Sheep and bullocks (which are said to be better than those obtainable at Maskat) can be procured from the country, but with some delay, also vegetables, fish, etc. There is no coal.

Communication.—The vessels of the British Indian Steam Navigation Company's subsidiary mail service between Bombay and Basra call at Chahbar fortnightly, both ways. There is telegraphic communication with all ports.

The territory from Chahbar to Sadaich River, 100 miles to the westward, is under the Chief of Geh, who also rules over the Bahu and Dashtiyari districts, and is tributary to Persia. There are several villages near the coast and some cultivation; large numbers of camels are bred, and flocks of sheep and goats are maintained wherever pasture is available.

The coast from Ras Kuhlab trends west-northwestward 11 miles to Ras Pazim, increasing in height from near Ras Kuhlab. It may be approached to 1 mile.

Ras Pazim (Puzim) (lat. 25° 19′, long. 60° 17′) is a cliff about 300 feet high. There is a depth of 3 fathoms 1 mile off and around the point, outside which there are depths of from 6 to 8 fathoms.

Pazim Bay, the entrance to which is between Ras Pazim and Ras Rashidi, 5 miles to the westward, extends 3 miles northward by the chart, but it is reported to extend farther northward; its shores within the points are low sand. The bay has 5 fathoms water in the entrance, whence the depth decreases to the shore.

Northward of and sheltered by Ras Pazim is Puzim, a little fishing village, and on the western side are a few huts on the sandy isthmus northward of Ras Rashidi. A large creek (Sirgan River) enters the northeastern part of the bay, and Kair River, which flows from the town of Geh, more than 50 miles inland, enters the bay about 1½ miles northward of Ras Rashidi; its mouth is a salt-water creek. Kair village and district, where there is much cultivation, are on the right bank of this river, about 4 miles inland.

Anchorage can be obtained in about 4 fathoms water off Puzim Village, and also on the western side of the bay.

Baklang Rock (lat. 25° 17′, long. 60° 13′), off the entrance to Pazim Bay, and 2½ miles, 137°, from Ras Rashidi, is about 100 yards in extent, and dries; there are depths of 5 to 6 fathoms water close around, and the rock, when covered, does not show with smooth water. The low brown hills northeastward of Ras Tank half their width open southward of the west cliff of Rashidi promonotory leads directly over the rock; in clear weather, Bir Peak will then be seen in the gap between these marks, the northeastern of the two highest peaks being in line with Rashidi Promonotory west cliff, and three peaks only being visible. From outside the rock, a fourth peak is open southward of Rashidi Promontory.

The 10-fathom curve is about 3 miles, the 20-fathom curve 5 miles, and the 100-fathom curve 8 miles southward of Baklang Rock. There is a depth of 14 fathoms 4½ miles southward of the rock, and eastward or westward of this position are depths of from 18 to 19 fathoms. At night, do not approach Baklang Rock to less than 20 fathoms.

Ras Rashidi is the eastern end of a promontory, the coast of which trends westward 5½ miles. There is a depth of 4 fathoms ½ mile southward of the ras. The promontory is 150 feet high, table-topped, and nearly level, but almost inacessible on all sides; it is 1 mile broad, and the land northward of it is low and sandy.

The western point of the promontory is somewhat higher than Ras Rashidi, and is also a vertical cliff. The bay between the western point of Rashidi Promontory and Ras Tank, 10½ miles to the westward, extends northward nearly 2 miles, and the shore is low sand hills.

A small group of brown hills lies 4 miles northeastward of Ras Tank, with some date palms and a few large trees to the westward, and is a good mark.

Tank Village lies about 3 miles up a large creek, a branch of Kair River, which enters the sea close eastward of Ras Tank. The river bar is shallow but is sheltered by the ras; there is deep water inside, where the creek is ¼ mile wide. The river flows from the northeastward, and close inside the shore sand hills, until near its mouth.

Fishing boats from Maskat trade with the village, and also with the people from the interior; they bring dates, cotton cloth, etc., and return with pish, ghi, etc.

Aspect.—The great plain continues inland of Pazim and Rashidi Promontories for about 12 miles, where mountains, part of the range seen from Chahbar, run nearly parallel with the coast. In front of these are some lower hills, one of which, Kuh Milin, 6 miles inland, is conical.

Ras Tank (lat. 25° 20′, long. 59° 53′) is a rocky promontory 1 mile long east and west, with sand hills about 30 feet high; it project about 1 mile from the coast, and the isthmus between is sand and 50 yards broad.

The south coast of Ras Tank may be approached to a distance of ½ mile, or to a depth of 7 fathoms; shoal water extends eastward from the promontory, where there is a depth of 4 fathoms at the distance of a mile. The little bay on the western side is shallow, and shoal water extends about 2 miles westward from the western point of the promontory.

Soundings.—The 100-fathom curve is 6 miles southward of Ras Tank, and at night the ras should not be approached to less than 30 fathoms; it should be given a wide berth, as the lead gives little warning.

The coast from Ras Tank trends west-northwestward 3 miles and is cliffy; it then turns westward 14 miles to Makki bluff, and is low. Hamadan (Humdan) Village and grove lie on the banks of a creek 3½ miles eastward of Makki Bluff.

Makki Bluff is about 100 feet high; the coast in the vicinity is reported to be incorrectly charted, and should be approached with caution (1911).

Kuh Kalat is a great range of white clay cliffs of striking outline; its extremity is about 11 miles northward of Ras Tank, and it extends westward some 20 miles. A vertical cliff, 650 feet high, and conspicuous from the southeastward, rises about 4 miles from the eastern end of the range. Bir, the summit, is a sharp double peak, 1,680 feet high. A remarkable single spiked peak, about 1,350 feet high, lies about 3½ miles southwestward from Bir. Bearing 41° from a distance of 33 miles they present themselves as a group of three conical peaks, and form a good landmark. It is reported that the Kuh Kalat range extends east and west from the single spiked peak, Bir peak being isolated.

The inland range of mountains from northward of Ras Tank becomes lower and less conspicuous to the westward.

Discolored water has been observed off the coast from Ras Tank westward to Ras Jagin; it depends on the water brought down by

the creeks, and is carried along the coast by the tidal currents. The edge of the discoloration should not be taken as a guide to the depth, as its distance from the shore constantly varies.

The coast from Makki Bluff trends northwestward 8 miles and then turns west-southwestward 21 miles to Ras Maidani; it is low and sandy, with creeks and backwaters inside. Khur Doruk (Darak) is about 6 miles northwestward of Makki Bluff, and there is anchorage in 2½ fathoms ½ mile offshore.

Khur Galag (Kaur Galag) (lat. 25° 27′, long. 59° 23′), about 11 miles west-northwestward of Makki Bluff, is the entrance to Rapch River, which has a course from the interior of over 100 miles. The entrance points are about 1 foot high, and there is a small village about 1 mile in on the left bank; here there are a few palm trees, and the natives are friendly. The bar, on which there is always a surf, extends about 1¼ miles off the khur, and the channel over it trends northwestward, and has a depth of about 1¼ fathoms. The river nearly dries, but there is a depth of about 3 feet off the western entrance point, where is the best landing with westerly winds. Dhows occasionally enter at half tide; they take sheep and goats, which are brought from the interior, to Maskat. The tidal rise appears to be about 9 feet.

There is anchorage in 5 fathoms 2½ miles, 170°, from the entrance; the water seems to shoal quickly from 5 to 2 fathoms. The tops only of the palm trees at the village can be seen from the westward, the lower parts being obscured by sand hills; on northerly to westerly bearings the trees are noticeable.

The best way to enter the river is to approach the eastern shore till the river is well open, and then steer direct to the western entrance point, keeping close to the breakers to the westward. The condition of the entrance may be subject to change.

Khur Rabij (Kaur Rapch) 8 miles westward of Khur Galag, is the entrance to a large tidal backwater, in which there is a channel with from 6½ to 1½ fathoms water, but is otherwise encumbered with flats of mud and sand. The entrance to the khur is about 600 yards wide, but it is fronted for about 1¼ miles by a bar, which has a depth of 3 feet, and breaks at low water.

The entrance points are low sand hills, and there is a beacon surmounted by a triangle on Ras el Khur, the eastern point; close southward of the beacon is a heap. To enter the khur approach the bar as close as possible with the beacon, or heap, in range with the eastern edge of Korat el Usif (80 feet), 349°; then steer 334°, across the bar, looking out for breakers to the eastward. When inside the bar, steer to pass 200 yards off a fuzzy bush on Ras el Khur. Then steer to the western shore, along which the water is deep to abreast a

low sandy spit, projecting from the eastern shore. Landing can be made near the fuzzy bush or on the low sandy spit.

The country near the khur is desert, and the khur appears to be of no importance, being only used by fishing boats. Inland of Khur Rabij is the Karwan district, where there are several villages and groves of date palms.

Anchorage has been obtained in 4¼ to 4¾ fathoms, sand, about 2½ miles southward of the entrance.

Tides.—It is high water, full and change, at Khur Rabij at 10 h. 10 m.; springs rise 9½ feet, neaps 6¼ feet.

The coast from Khur Rabij trends west-southwestward 7 miles to Ras Maidani, and is low.

Shoal water of less than 3 fathoms extends about 1½ miles off it, and the 10-fathom curve is distant from 4 to 5 miles.

Ras Maidani (Maidani) (lat. 25° 23′, long. 59° 07′) is white cliffs, 155 feet high, which extend westward about 3 miles, whence the coast is low and sandy, with small bushes for 2 miles farther westward. The hills, which terminate in the cliffs, are about 200 feet high, table topped, and brown in color. Westward of the cliffs and a short distance inland is a large date grove.

The coast from 5 miles westward of Ras Maidani trends northwestward 9 miles, and then turns westward 13 miles to Sadaich River; it is low. Passing northward of the hills near Ras Maidani, the great coast plain continues westward about 60 miles.

Shoal.—The shoal water which extends 1½ miles off Ras Maidani continues off the coast 10 miles westward and northwestward; it attains its greatest breadth of 3 miles about 5 miles westward of the ras, where it has depths of from 1 to 2 fathoms; the 20-fathom curve is 3 miles to the southward, and the 100-fathom curve about 5 miles off the coast. Caution is necessary in navigating along this coast, especially at night; the soundings off the shoal water are very little guide.

Landing.—Good landing can be obtained in a little bay formed by a small rocky point about 8 miles eastward of Sadaich River.

Kuh Gukardi, about 2 to 4 miles inland, 6 miles eastward of Sadaich River, has three principal conical peaks, the northern and highest being 490 feet high. There are some rocks, from 20 to 50 feet high, on the plain, about 5 miles eastward of these hills.

Sadaich River is a tidal creek with a shallow bar and swampy ground near its mouth; its course beyond the mountains has not been explored.

There is not sufficient water on the bar at the low water for a boat to cross and there is very little water inside; probably the entrance is subject to change. A trade is carried on by small craft from Mas-

kat; here they load with mats, salt fish, etc. Shoal water extends about 2 miles off the river, and the coast for 10 miles to the eastward.

On the banks of the river, some distance inland, is Sadaich district, with a village, date groves, and some cultivation.

Bashakird, the country westward of the Sadaich, is very mountainous, but little is known of it; Biyaban Plain, between the coast and the mountains, is narrow.

The coast range extends from Quoin Mountain, 2,120 feet high, which is situated 20 miles northeastward of the entrance to Sadaich River, and has a great valley on its western side, westward toward Jashk; the height of the peaks varies from 1,400 to 2,540 feet.

Jabal Shahu, 6,220 feet high, situated 36 miles north-northwestward of the entrance to Sadaich River, is the summit of an inland range; it appears almost detached, and on northwesterly bearings its eastern side shows a great bluff, the top sloping westward, but on easterly bearings it has a rounded form.

Suraf, a range of white sand hills, about 100 feet high and without vegetation, extends 6 miles westward along the beach from Sadaich River. Water is found by digging in the hollows of these sandhills.

The coast from Suraf sand hills trends westward 25 miles to Ras Jagin; it is very low, with mangrove swamps and numerous creeks. The creek (lat. 25° 36′, long. 58° 34′) immediately westward of the sandhills affords shelter for boats; it has about 2 feet water on the bar, and 6 to 8 feet a short distance inside, the banks being about 6 feet high and steep-to. The other creeks are also visited by boats for firewood and fish; they are mouths of streams from the Bashakird Mountains, the Gabrig and Jagin Rivers being the principal.

Gabrig River (Gabrig) entrance is 11½ miles westward of Suraf sand hills, and shoal water extends about 2 miles off the coast between Sadaich River and it. There is an isolated sand hill covered with scrub 1¼ miles westward of the entrance, and a conspicuous tree on a sand hill 6½ miles eastward of it. The boat channel is at the eastern end of the bar, and has 1 foot water. Anchorage can be obtained in 5 fathoms water 2 miles offshore, but the depth decreases quickly from 5 to 2 fathoms inshore.

A northeasterly current has been experienced between the mouth of the river and Ras Jagin.

Soundings.—Between Ras Maidani and Ras Jagin the depths are regular; the 100-fathom curve is about 18 miles southward of the coast westward of Suraf sand hills, shoaling to 20 fathoms at 5 miles, and to 3 fathoms at 2 miles, but near Ras Jagin the water is deeper.

Ras Jagin (Jagin) is very low, rounded, and sandy; the mouth of Jagin River is close eastward of the ras; a sandy spit, which dries, extends ½ mile southwestward from the ras, around which

the 3-fathom curve is distant about 1 mile; it is probable that the configuration of the point alters after heavy rains or storms. There are from 18 to 20 fathoms within 1 mile of the spit, so the lead is scarcely any guide in passing it, and caution is necessary. Inland of Ras Jagin is a mangrove swamp, with a plain extending to the hills. As this point is difficult to make out, do not be misled as to the distance from it by the appearance of the distant hills. The 100-fathom curve is 5 miles off Ras Jagin, which therefore requires a wide berth at night.

Jashk East Bay.—The coast from Ras Jagin trends northwestward 12 miles and then turns west-southwestward 10½ miles to Cape Jashk (lat. 25° 38′, long. 57° 46′), Jashk East Bay, the bay between having deep water, there being 20 fathoms about 2 to 3 miles, and, towards Cape Jashk, 100 fathoms 3 miles from the shore.

The northeastern shore of the bay is low, the sandy beach drying upward of ½ mile off the creeks. Khur Lash, 8 miles northwestward of Ras Jagin, is large. At the head of the bay, the hills approach within 1 mile of the shore, and the coast range ends here in Kuh Ushadan (Gazdan), a ridge of white chiffs, 1,720 feet high, which, on easterly bearing, is quoin shaped. There is a village with a few date trees between it and the sea. The northwestern shore of the bay is rocky, about 14 feet high, and level, with a sandy beach, scattered rocky ledges, and low cliffs in places.

Beacon.—A stone beacon, 30 feet high and painted black and white in horizontal stripes, stands on the shore near the cable house, ½ mile eastward of Cape Jashk.

Anchorage.—There is anchorage, somewhat sheltered in westerly winds, close off the northwestern shore of the bay, in from 6 to 8 fathoms. The bay is open to the southeastward, and there is generally a light surf on the beach, which becomes heavy during the southwest monsoon in the Indian Ocean, although there may be only a slightly perceptible ground swell.

The anchorage is open to a winter easterly gale. In a shamal the wind is westerly, and the anchorage is said then to be good, but much swell rolls round the cape, making a vessel very uneasy. For telegraphic notice of a shamal.

Near Cape Jashk a good position is with the stone beacon bearing 286°, distant 1 mile, in about 5 fathoms water.

Telegraph cables.—To avoid fouling the telegraph cables on the east side of Cape Jashk, vessels are cautioned not to anchor to the southward of the line of the beacon near the cable house, bearing 270°; nor eastward of the line of the same beacon in range with conspicuous tree, bearing 46°.

Landing.—The best landing place is on the sandy beach between the beacon and the cliffs to the eastward.

Cape Jashk (Maksa) is low and projecting; there is a small tomb, 15 feet above high water, on its extremity.

Jashk Bay.—The coast from Cape Jashk trends northward ½ mile, when it turns east-northeastward and northward 3½ miles to the entrance of Jashk Creek, and is sand hills from 10 to 20 feet high; it then trends northwestward 4 miles, and is sand hills.

The bay northward of Cape Jashk affords shelter from easterly winds northwestward of the telegraph buildings in any required depth, partially sheltered from southerly winds by the flat extending from the cape and by Mason Shoal.

Light.—A fixed white light is exhibited from the southern tower of the telegraph buildings, and should be seen from a distance of 12 miles. The light is visible over an arc of 225°, but it will be directed to the eastward or westward as required, when arranged for by signal or telegraph to the superintendent of telegraphs, Jashk.

Shoals.—A flat, 1 mile broad, with depths of 2½ and 3 fathoms, extends 2 miles west-northwestward from Cape Jashk (lat. 25° 38′, long. 57° 46′), and affords some slight shelter to the anchorage.

Buoy.—A red can buoy, surmounted by a cage, is moored on the northern side of the flat.

Clearing marks.—The south tower of the telegraph buildings just open westward of the north tower, 149°, leads eastward of the northern part of the flat. These marks lead to the inner anchorage.

Mason Shoal, 3 miles west-southwestward of Cape Jashk, is 1,600 yards long north and south and ½ mile broad, within the 3-fathom curve; it has a least depth of 2¾ fathoms, coarse sand and shells; there are depths of from 8 to 10 fathoms close to its southern side. There is a channel 1½ miles wide, with from 3¼ to 7 fathoms, between it and Cape Jashk flat.

Anchorages.—There is convenient anchorage, but open to shamals, for vessels of not more than 16 feet draft in 3½ fathoms water, with Cape Jashk bearing 175°, and a conspicuous tree 85°, 1,800 yards from the beacon; and farther out in 4½ fathoms with the cape bearing 156°, 2¼ miles.

Warning of the approach of a shamal can often be obtained at the telegraph office, where information is received at the beginning of a shamal at Abu Shahr (Bushire); it may be expected at Jashk about three days later.

Directions.—From the southward and eastward, bring Cape Jashk to bear 0°, 1½ miles, then steer 312° until the cape bears 109°, then steer 0° until a conspicuous tree, about 2 miles northeastward of the telegraph building, bears 96°; then steer westward, passing northward of the buoy, to the anchorage required. This route has a least depth of 3¾ fathoms.

The western extremity of Jabal Dangiya, bearing 354°, is said to lead between the shoals off Cape Jashk and Mason Shoal.

Tides.—It is high water, full and change, in Jashk Bay at 9 h. 30 m.; springs rise 9 feet. The tidal currents off the coast between Cape Jashk and Ras al Kuh set westward during the rising and eastward during the ebb tide; the currents are weak near Cape Jashk, but the velocity increases toward Ras al Kuh.

Soundings.—The 100-fathom curve is 2½ miles southward of Cape Jashk, and the 10-fathom curve is about 1¼ miles from the cape.

Jashk Village (lat. 25° 38′, long. 57° 46′), which is of considerable size, extends 1 mile northeastward along the shore of the bay from ½ mile northeastward of the cape.

The telegraph buildings, about 800 yards northeastward of the cape, are three fine flat-roofed blocks, the north and south blocks having conspicuous square towers; a flag is flown from the flagstaff, 80 feet high, near the office, and a vessel's blue light at night would be answered.

The British India Steam Navigation Co.'s office and flagstaff are between the telegraph buildings and a fort, 600 yards northeastward.

Landing.—There is good landing within a rocky point (lat. 25° 38′, long. 57° 46′) northward of the telegraph buildings.

Supplies.—The best water is from wells about 1 mile northeastward of the telegraph buildings and near some conspicuous date groves; the larger water tank, erected on posts near the well and roofed in, is noticeable. There is a supply of rain water stored in reservoirs near the telegraph buildings.

Bread and meat can be obtained, but no vegetables; fish is plentiful. There is no coal.

Communication.—The vessels of the British India Steam Navigation Co.'s subsidiary mail service between Bombay and Basra call at Jashk fortnightly, both on the passage to and from the gulf.

Lloyd's signal station.—There is a Lloyd's signal station at Jashk; it is under the direction of the Indo-European Telegraph Co. Communication can be made by the International code. No lookout, however, is kept and vessels desiring to communicate must attract attention by steam siren or otherwise.

Telegraph.—There is telegraphic communication with all parts and at all hours.

Jashk Creek.—Dry sands extend nearly 1 mile off the mouth of this creek, but there is a channel with 1½ feet water through them; the water is deeper inside and the creek, which has a winding course of about 4 miles, is used by native boats; the land in the vicinity is a mangrove swamp.

Jashk fort, 6½ miles northward of the small tomb, is in a ruinous state, with a few houses and date trees near it, and a range of white sandhills to the southeastward. It stands 1 mile inland, and is not noticeable from seaward. There are about 200 men here, all cultivators and herdsmen.

The coast from about 4 miles northwestward of Jashk Creek trends westward 24 miles to Ras al Kuh; it is low sand, with tufts of grass and several shallow creeks, connecting at times with the sea, and mangrove swamps inside. At some distance inland are many date groves.

Khur Hamad, the most important of the creeks, 8 miles eastward of Ras al Kuh, is used by native boats; it leads into Gangan River.

Aspect.—Several prominent mountains and hills in this locality are visible from seaward long before the coast. Jabal Dangiya (Quoin Hill), 12½ miles, 348°, from Cape Jashk, is 1,630 feet high, and isolated; its western side is a great bluff, which shows well against the land behind, except on easterly bearings, when it is less conspicuous; there is a great valley between it and Kuh Ushadan. Jabal Bahmadi, the summit of which, situated 7 miles northwestward of Jabal Dangiya, is 3,100 feet high, is separated from Jabal Dangiya by a gap with precipitous sides; it has a long westerly slope and a very serrated outline. On its southern slope, 3¾ miles west-northwestward of Jabal Dangiya, is a natural pillar of rock. From Jabal Bahmadi the mountains trend north-northwestward, with a valley between them and the coast ranges.

Jabal Khur Hamad, 9 miles westward of Jabal Dangiya, and 4 miles inland, is a ridge extending 2 miles westward, about 300 feet high, with cliffs on its southern side.

Soundings.—The 100-fathom curve is about 14 miles off the coast about midway between Cape Jashk and Ras al Kuh, but southward of Ras al Kuh it is distant 6½ miles.

The water is shoal off the coast, the 3-fathom curve being about 1½ miles distant from it.

Gahha shoal (lat. 25° 42′, long. 57° 28′), a small 1½-fathom patch, with soft bottom and 13 fathoms around, lies 3 miles offshore, and 16¾ miles, 285°, from Cape Jashk.

A patch, with 10 fathoms water, lies 2 miles, 169°, from the shoal. When navigating between Cape Jashk and Ras al Kuh, do not decrease the depth to less than 27 fathoms in the vicinity of Gahha shoal.

Caution.—From the extreme shallowness of the water bordering this coast, as well as the presence of Gahha Shoal, great caution is necessary when near it, the land being so low that an error in judging distance from it is both possible and probable.

Ras al Kuh (Kuh) (lat. 25° 47′, long. 57° 19′) is very low, and the 3-fathom curve is about ½ mile off it; here the coast turns northward. The coast is a sand beach with tufts of grass, and the country immediately inside it is swampy for several miles. A small creek, the entrance to which is close northwestward of the ras, and has dry sands 600 yards off it, is frequented by boats. Mugmalam, a small village, with a date grove, is about 3 miles to the northeastward.

Anchorage.—There is anchorage 1 mile southeastward of the ras and from ½ to ¾ mile offshore, in from 6 to 10 fathoms, but there is no shelter from a shamal, which blows here from a little northward of west.

CHAPTER IX.

ENTRANCE TO PERSIAN GULF, EASTERN AND NORTHERN SHORES.

RAS AL KUH TO RAS BISTANA.

(Lat. 25° 47′, long. 57° 19′, to lat. 26° 30′, long. 54° 38′.)

The coast.—Ranges of high mountains extend along, and at moderate distances from the coast between Ras al Kuh and Ras Bistana, and are good marks. There are a few villages and towns along the coast, with a mixed population, the fishermen or seafaring portion being Arabians and the cultivators, etc., chiefly Persians. There are date groves and some cultivation near most of the towns: other trees are scarce and small, except a banyan tree occasionally.

From Ras al Kuh to Guru, 50 miles north-northwestward, the coast is very low, with a plain of varying width extending to the mountains. It is imperfectly known, and must be approached with great caution. There is deep water generally a short distance off the coast, so that soundings are but little guide when approaching it. The coast is visible from but a short distance. In estimating the distance from it, guard against being deceived by the appearance of the high land in the background. There is no shelter in a shamal and anchorage is bad.

No supplies can be obtained.

The coast from Ras al Kuh trends northward 9 miles and then turns northwestward 6 miles to Ras ash Shir.

Kuh i Mubarak (lat. 25° 50′, long. 57° 19′), 3¼ miles northward of Ras al Kuh, and about 1 mile inland in the swampy plain, is 333 feet high, very remarkable, precipitous, rocky, cylindrical in shape, and of light color, standing quite isolated; there is a small hole in its upper eastern corner, which is open on northwesterly and southeasterly bearings. It is conspicuous except when seen against the light-colored hills behind. When on northwesterly or southeasterly bearings, with the low land not in sight, it looks like an outlying rock.

The Bluff, about 4½ miles north-northeastward of Kuh i Mubarak, is 720 feet high, and White Pillar Rock stands up conspicuously on its western side.

Proserpine Rock, close to the coast, nearly 10 miles northward of Ras al Kuh, about 70 feet high, and quoin-shaped, the bluff being to the westward. The 3-fathom curve is about ¾ mile off the coast from 2 miles northward to Ras al Kuh to Proserpine Rock.

There is a tower on the coast about 1¼ miles northward of Proserpine Rock, and northward of the tower is a small khur, with depths of 2 to 4 feet water. Sarocan Village is situated at the head of the khur; it has a population of about 60 under a chief, who were quite friendly when visited by a British naval vessel in 1908.

Ras ash Shir is very low, with one or two huts on it, and dries off nearly ½ mile. Quoin Hill, about 3¼ miles eastward of the ras and 1¼ miles inland, is a peak 720 feet high, part of a light-colored ridge, trending parallel to the coast, which decreases in height to the southward, and ends about 3 miles northeastward of Kuh i Mubarak. Tujak, 2 miles northeastward of the ras, is a small village.

Caution.—A flat of sand and mud, with less than 3 fathoms water, extends 3 miles off Ras ash Shir, and the water over it is discolored. There are depths of 20 fathoms 1 to 1½ miles from the 3-fathom curve, toward which the soundings decrease rapidly; therefore give the point a wide berth, especially at night.

Bank.—A depth of 9½ fathoms was found on a bank situated in the fairway of the gulf, in lat. 26° 09′, long. 56° 51′, approx., with depths of 40 fathoms around (1917). There is probably less water.

Biyaban (Biyábán) is the coastal country between Cape Jashk and Khur Minau, whilst Bashakird is the mountainous district farther inland, from Ras Jagin to Khur Minau.

The coast from Ras ash Shir trends northward 12 miles to Kunari Point, which is very low and partially covered at high water; here there are many mangroves. The flat of sand and mud extending off Ras ash Shir continues off the coast to the northward, decreasing in width to about 1½ miles off Kunari Point; the coast should not be approached at night, nor in thick weather.

Shoal.—A detached patch (lat. 26° 11′, long. 57° 07′), with 4 fathoms water, lies 2½ miles west-southwestward of Kunari Point, with 14 fathoms close westward of it.

Jabal Karya, 11 miles north-northeastward of Ras ash Shir, is a remarkable peak, 1,910 feet high, of light color, part of the second ridge of hills from the coast; from the westward it has a jagged outline, but from the northwestward or southward it appears a fine peak with almost precipitous sides.

Jabal Bis (lat. 26° 12′, long. 57° 33′), 14½ miles eastward of Jabal Karya, is a peak, 4,600 feet high, and conspicuous except from close inshore, where it is obscured by lower intervening ranges; from the northward or southward it is conical. There is a valley between it and the Karya Range.

The coast from Kunari Point trends north-northwestward and northward 23 miles to Guru village, and between it and Musandam Island on the western side, is the narrowest part of the entrance to the Persian Gulf. The coast is low to Turu, about 3 miles southward of Guru, where sandhills begin and extend some distance northward.

The 3-fathom curve is from 1 to 2¼ miles off the coast, and a sounding of 2 fathoms has been obtained 1¾ miles off the coast 5 miles northward of Kunari Point.

Kunari River entrance is about 6 miles northwestward of Kunari Point, and there was a depth of about 4 feet over the bar in 1909, and about 14 feet inside. The river, which runs northward, has been ascended by boats about 3½ miles; it then appeared to divide into two branches, one trending northeastward, and the other north-northwestward. The banks of the river are low and covered with mangroves. Curlew and oyster catchers can be procured; herons, cranes, and other birds abound. Firewood is plentiful, and easily obtained. There are no signs of habitation. Kunari town is said to be about 11 miles from the mouth of the river.

Gaz river, about 12 miles northward of Kunari River, appears to be deep enough to admit coasting craft; it can not be distinguished from seaward.

About 14 miles northward of Kunari River is a sandy point, with Bandar Sirik, a small backwater which is used by dhows, near it; Sirik village is some distance inland; landing can be effected about a quarter of a mile northward of Bandar Sirik.

Turu is a small village, with many date trees.

Guru (Girau) is a small village and fort with a date grove, about ½ mile inland. The fort is white, and not noticeable, being situated in a date grove. The sand hills here are 30 or 40 feet high, with a gap, which serves to mark the village; the country inside them seems to be well cultivated. The people appear to be almost entirely agricultural, but they possess a few fishing boats, which are hauled up in a little creek formed by a watercourse.

Guru is westward of the middle and nearest part of a range of hills, about 3 miles inland, and running north-northwest and south-southeast; they are of irregular outline, but with no remarkable peaks. There are 3 fathoms water 1¾ miles offshore at Guru, and 5 fathoms 3 miles.

Tides and tidal currents.—It is high water, full and change, at Guru (lat. 26° 35′, long. 57° 06′), about 9 h. 30 m. The tidal current is said to set northward from 3 hours before until 3 hours after high water, and southward from 3 hours after high water until 3 hours before the next high water.

The currents are weak eastward of Ras al Kuh, round which, however, and along the shore to the northward, they are strong, attaining a rate of 2 knots at springs.

Directions.—In entering the Persian Gulf from the eastward avoid Mason Shoal and do not approach Gahha Shoal to less than 27 fathoms; a wide berth should be given to these shoals, and Ras al Kuh, off which the water is deep, at night or in thick weather.

Northward of Ras al Kuh, do not stand into less than 35 fathoms until northward of Kunari Point, when stand into not less than 10 fathoms by day, or 15 fathoms at night, northward and westward to Jezirat Hormuz. A depth of 40 fathoms leads about 11 miles eastward, and nearly 7 miles northeastward of the Salama wa Binataha, but there are depths of 48 to 57 fathoms near those islets.

A sailing vessel should not approach the coast near Guru nor between it and Hormuz if a shamal is likely to set in, as, in this locality, that wind blows from west-southwestward, and raises a very bad sea, rendering it dangerous to become embayed between Guru and Khur Minau. No native vessels visit the coast except such as can either be hauled up or get into the creeks. For larger vessels Hormuz is then the only available place of shelter, unless far enough to windward to fetch into Kishm Road.

The coast from Guru trends north-northwestward 28 miles and then northwestward 8 miles to Khur Minau, and, except for some 5 miles northward of Guru, and also about 8 miles northward of Guru, where a low spur of the coast range approaches the sea near Kalla village, it is low and swampy, with mangroves in places.

About 15 miles northward of Guru, the hills recede from the sea, leaving a level district from 10 to 20 miles or more in width, parts of which are fertile. Inland, there are very high mountains, on which snow lies for months. The coast is seldom visited by Europeans.

The 3-fathom curve is from ½ to 1¾ miles, and the 10-fathom curve from 3 to 4½ miles off the coast northward to Kuhistak. Northwestward of the vicinity of Kuhistak, the soundings are scanty, the 5-fathom curve appears to be about 4 miles off the coast; 5½ miles southward of Khur Minau, a sounding of 10 fathoms, and 4 miles southward of the khur, a sounding of 5 fathoms, were reported in 1910; these depths are much less than those charted hereabouts. There are no outlying shoals.

Kuhistak Village, on the coast about 14 miles north-northwestward of Guru, can be recognized by the fort, from 80 to 100 feet high, standing on a little isolated hill just eastward of it; there are some date trees around it; the inhabitants are chiefly fishermen. The nearest hills are about 2 miles from the coast, and thence they trend inland, the plain increasing in width to the northward.

Supplies.—Sheep, fowls, and eggs can be obtained in limited quantities at Kuhistak.

Khagun Village, on the coast, about 10 miles north-northwestward of Kuhistak, is small, containing about 150 men, chiefly fishermen, and there are a few date trees. A creek on its northern side gives shelter to the boats. The coast is low and sandy, but the locality is marked by a turtle backed hillock and several date palms.

Khur Minau (Mínáb) is a salt water mangrove creek into which Minau (Minab) River flows; the bar nearly dries, and the creek is used by small craft of 20 tons and less, chiefly from Kishm and Bandar Abbas; the bar is impracticable during a shamal, and some craft are occasionally lost on the bar. There are very similar creeks on both sides of Khur Minau, but the entrance to it can at present be recognized by two large mangrove trees close together a short distance southeastward. The middle of the bar is marked by a wooden post about 6 feet high.

The khur trends northeastward about 1½ miles from the bar through sand and mud flats; the river then passes between banks covered with mangroves southeastward 2 miles, and then east-northeastward 4 miles to the head; here is the Shahbandar, commonly known as Tiab or Customhouse, where the vessels unload. The banks are everywhere flooded at high water, and the river decreases in size until it is a mere ditch. The river, when swollen by winter rains, becomes a rushing torrent of considerable breadth. The Shahbandar is the only permanent building. Khur Minau is the port of Minau town, and at certain seasons as many as 20 boats arrive and leave in one day. Merchandise is carried between Shahbandar and Minau on camels and donkeys.

Minau Town (Mínáb) (lat. 27° 09′, long. 57° 05′) lies 12 miles eastward of Shahbandar; the track for the first 2 miles crosses the mud flat surrounding Shahbandar, and then passes for some distance through date grooves and gardens, where there are several small scattered villages. Minau Fort is on a hill close to a small river and appears large and imposing, though it is very dilapidated.

The town is mat huts, and on its southern side are extensive gardens and plantations; the bazaar is outside the fort and is well supplied. The district is governed by a Zabit, who is under the deputy governor of Bandar Abbas; the people are well disposed to Europeans.

Trade.—The trade is considerable. The district produces dates, plantains, mangoes, wheat, henna, etc. The imports are rice and wheat; the exports dates, henna, wool, and ghi.

Mountains.—Overhanging peak, 10 miles east-southeastward of Minau Fort, is a sharp pinnacle about 3,000 feet high, which on

north-northeasterly bearings shows two peaks; it is situated at the southern end of a level topped range which extends 6½ miles north-northwestward to Ragged Peak.

Ragged Peak (lat. 27° 11′, long. 57° 12′) is about 3,000 feet high and of very jagged outline.

Jabal Shimil (Shamíl), 30 miles northward of Khur Minau entrance, is 8,500 feet high, and very conspicuous from the entrance to the gulf. The upper part of the western side of the mountains is a bluff, and eastward of it is a remarkable cone about 5,000 feet high.

Jabal Ginao (Kúh Ginau), 16 miles north-northwestward of Bandar Abbas, is a detached mountain of irregular outline 7,690 feet high.

Jabal Bakhun (Kúh Bakhún), 42 miles northward of Bandar Abbas, is 10,660 feet high, and is visible, in clear weather, through the great valley between Jabal Shimil and Ginao; Jabal Bakhun is covered with snow during winter.

The coast from Khur Minau trends westward 26 miles to Bandar Abbas; it is low and swampy, the eastern part being covered with mangroves, and is bordered by a mud flat from about 1 to 2 miles broad, about 1 to 1½ miles outside which there are depths of from 3 to 4 fathoms.

Jezirat Hormuz, 1¾ miles southward of the coast, 16 miles westward of Khur Minau, is circular in shape, with a long low point at the northern end, about 4 miles in diameter, and mostly hills about 300 feet high, with a very rugged outline and marked variety of colors, red, purple, etc.; in the middle a few white peaks resembling snow-covered hills rise high above the rest. Great White Peak, the summit, 690 feet high, near the center of the island, 2½ miles south-southeastward from the fort, has a long slope eastward, and makes a very sharp peak. The hills, with the remarkable exception of the white peaks, are chiefly of rock salt, with a thin incrustation of various colored earths. Near the south and southeast coasts is a range not of salt. There are a few detached rocky hillocks on the east coast.

The old city stood on the plain, on the northern side of the island. The only remains now visible from seaward are the Portuguese fort (lat. 27° 6′, long. 56° 27′), on the north point, in a dilapidated condition, and said to have been damaged by an earthquake in 1902; its highest part is 45 feet high. There is a minaret 70 feet high about 400 yards southward of the fort.

Hormuz Village, close southward of the fort, is about 250 to 300 mat huts, and the island has approximately a population of about 1,000 males, who are employed chiefly in fishing and collecting salt, but the plain is carefully cultivated and is evidently productive. The people own about 20 fishing boats, and a few larger craft which

trade to Maskat and Bandar Abbas, chiefly with salt and salt fish. There is a guard of a dozen men in the fort. In the hot weather during the southwest monsoon most of the inhabitants go to Minau, where they are employed in the date harvest.

Shoals.—Shoal water of about 2¾ fathoms extends 1,200 yards eastward of the Portuguese fort, and a flat, which dries, extends 700 yards northward of the eastern part of the north coast, with shoal water of about 2¾ fathoms ½ mile farther northward. There are depths of 8 and 9 fathoms between these shoals.

A shoal with 3½ fathoms water lies 65° 3 miles from the fort.

The east and southeast coasts of the island are bordered by reefs to the distance of from 400 to 1,200 yards. The south and southwest coasts are cliffs; shoal water appears to extend about 1½ miles from the west coast, and still farther southwestward.

Euphrates Patch.—In 1905 the steamship *Euphrates* touched on the 2-fathom patch off the southwestern extremity of Jezirat Hormuz, which was subsequently examined by the British naval vessel *Hermes;* from the patch the northwest extremity of the island bears 28° 3¼ miles. There is a depth of 5 fathoms about 100 yards northward, westward, southward, and eastward from it, the water in those directions deepening quickly to 10 fathoms, but a narrow shoal ridge connects it with the island reef to the northeastward.

Anchorage.—There is anchorage at Hormuz on the northern side of the island, with the fort bearing about 236° distant ½ mile, in from 7 to 8 fathoms, mud; small vessels anchor closer to the village. It is sheltered except from the nashi, on the occurrence of which the native boats shift to the westward of the fort.

The channel between the island and mud flat extending from the mainland is from 1¼ miles to 1,400 yards wide, with depths of from 4½ to 12 fathoms; the flat on the northern side is steep-to, the channel being close to the fort. There are from 2¾ to 4 fathoms in the channel, 2½ miles northwestward of the fort (lat. 27° 6′, long. 56° 28′), over an extensive flat.

Leading mark.—The ruin of a chapel, on the north coast of Jezirat Hormuz, opens its own breadth northeastward of the high southeastern tower of the Portuguese fort, 125° leads, in 2¾ fathoms least water, through the channel northwestward of the fort.

Soundings.—Nearly all round the island, except toward the Euphrates patch, there are depths of from 5 to 7 fathoms close to the fringing reef; there are depths of from 13 to 9 fathoms from 2 to 3 miles off the south and east coasts; there is deep water close southwestward and westward of Euphrates patch, and westward of the flat extending westward from the island.

Shoal.—The depths in the western approach to the channel northward of Hormuz are reported to have shoaled considerably.

Directions.—From about 1 mile eastward of the eastern extremity of the island steer about 325° till the Portuguese fort bears 255°, then steer westward and approach with the fort bearing 236°, anchoring as above directed. To proceed northwestward from the anchorage, pass ¼ mile northward of the fort and steer bring the mark above given bearing astern, following the deep-water channel as shown on the chart; when the high peak of Jazirat Larak bears 188° steer westward.

Tides.—It is high water, full and change, at Jezirat Hormuz at 10 h. 45 m.; springs rise 13 feet.

Supplies can not be obtained at Hormuz; there is water, but only in reservoirs, and generally in very small quantity. That coming down from the hills, even in rainy weather, is saturated with brine. There is good gazelle shooting in the island.

Bandar Abbas is a large town, situated on the mainland coast, from 9 to 10 miles northwestward of the Portuguese fort of Jezirat Hormuz. It stands on the beach and has a frontage of 1¼ miles. It is a place of considerable and increasing trade, being the end of the caravan route from Kirman. During the hot season many of the inhabitants migrate to Minau, etc., but during the cold season there may be a population of about 10,000. The landing at low water is bad, as the beach dries off from 200 to 500 yards. It is in the midst of a bare sandy plain, which rises gradually to some hills about 100 feet high, 1 to 2 miles to the northward; the country then becomes broken and reaches heights of from 500 to 700 feet. The town is fronted by a flat about 1½ miles broad, with less than 3 fathoms water, and the 5-fathom curve is about 4 miles southward of the beach.

Buoy.—A red conical buoy is moored about 2 miles offshore, at a distance of 2.7 miles, 156°, from the flagstaff at the British consulate.

Anchorage.—Vessels usually anchor in the vicinity of the red buoy, but smaller vessels can approach within 1¼ miles of the town.

Directions.—In approaching Bandar Abbas from the eastward, only small vessels should use the channel between Hormuz and the mainland, as it is only 1,600 yards in width off the fort, and has not been properly surveyed.

When passing between Larak and Hormuz, the former may be approached within ½ mile, but the latter should not be aproached nearer than 2½ miles until northward of Euphrates Patch, which is supposed to be steep-to.

In passing between Kishm and Larak Islands from the southwest, it is advisable to keep over toward the latter to avoid the strong irregular currents and shoal patches off Kishm Point.

Tides.—It is high water, full and change, at Bandar Abbas at 10 h. 41 m.; springs rise 11¼ feet and neaps rise 8½ feet about datum

of soundings; springs range 8¾ feet, neaps 4½ feet. The ebb current commences from 1 to 1½ hours after high water, and the flood current commences about half an hour after low water. The flood sets to the westward and the ebb to the eastward.

Bandar Abbas Town is a squalid collection of houses extending about 1½ miles along the shore, and about ½ mile inland; its people are poor and unprogressive. There are about 1,000 mud houses, many being two-storied. Except the main bazar, there are no streets, each house or group of houses standing in its own inclosure, and there is no wheeled traffic. There are a number of date, tamarisk, and other trees in the town. The negroid strain predominates among the lower orders and Baluch, Persian, and Arabian blood is also visible among all classes. There are about 100 Shikarpur Hindus here, in whose hands is probably about three-quarters of the trade of the port, and a small Khojah community. The official language is Persian, but the bulk of the people speak a patois almost unintelligible except to themselves. The town is the seat of a Persian deputy governor, who is subordinate to the governor of the gulf ports; he has authority over the districts of Minau (Minab) and Shimil (Shamil).

The governor's house, once a Dutch factory (lat. 27° 11′, long. 56° 17′), is situated near the pier, and is surmounted by a cupola, but it is not conspicuous.

Naband (Naiband) village, 1½ miles eastward of the British consulate, has a conspicuous date grove.

The port is the entrepôt for goods destined for the southeastern part of Persia, the two chief towns of which are Yazd and Kirman.

The British consulate, a gray stone two-storied house with a flagstaff, standing alone and conspicuous, is about 1 mile east-northeastward of the pier. In winter, when the mountains to the northward are covered with snow, the air is dry, clear, and bracing. In summer, however, these rocky masses reflect heat on to the plain below, and the climate is damp, hot, and relaxing, but is not such as to render it by any means unsupportable to a European who is comfortably lodged. The prevailing diseases are malarial fever and diseases of the skin; other diseases seldom exist in epidemic form. Sanitation of even the most elementary description is unknown.

Climate.—There is a cold season from November to April. The summer is very hot, but the land and sea breezes, which are then fairly regular, do much to mitigate the heat.

Supplies.—Meat, bread, and vegetables, also cattle and rice, can be obtained. Drinking water is obtained from reservoirs, situated westward of the town, where the surface rain water is collected in masonry tanks, called "birkehs"; these are covered by conspicuous dome-shaped roofs. It is also obtained from surface wells, sunk in the dry bed of a river at Naband; this is of bad quality, requiring

filtering; only a few tons can be supplied at a time; the water at Bandar Abbas is mainly obtained from shallow unbuilt wells and dirty rain-water reservoirs. The water elsewhere is brackish. There is no coal. Wood for fuel is brought in by road from the hills to the northward, and by boat from the mangrove swamps near Khamir. The bazaar is a rather good one. No coal is kept in stock.

Pier—Landing.—There is a masonry pier, 100 yards long and 30 yards wide, in front of the customhouse, and all goods are landed on it. The pier dries, and lighters can only go alongside from about 3 hours before until 3 hours after high water. It is always encumbered with merchandise. There is a flagstaff (lat. 27° 11′, long. 56° 17′) on the pier. The beach is firm sand, and dries off some 150 to 200 yards from high-water mark; landing on it is bad at low water. Landing operations are liable to be hindered by the weather, as the surf on the beach is very heavy at times.

Trade.—The principal imports are matches, candles, rice, sugar, tea, spices, iron, and cotton and woolen goods, and the exports, ghi, almonds and pistachios, raisins, currants, dates, asafetida, gum, wool, and carpets.

Currency.—The coinage current in the district is nickel pieces of 1 and 2 shahis; silver pieces of 1 (scarce), 2, and 5 (scarce) krans; Imperial Bank of Persia notes for 1, 2, 3, 5, 10, etc., tumans (very scarce). Indian rupees and notes of 5, 10, etc., rupees are plentiful, and freely used. Sovereigns are also used, and much sought after, but are scarce.

Weights and measures.—The following are in use: One miskal=0.0102 pounds, 1 Tabriz man=640 miskals (6½ pounds), 1 Shah man=1,280 miskals (13 pounds), 1 Bandar Abbas man=24 kiyás (9 pounds), and 1 Shah guz=1½ Lar guz (40 inches); the equivalents in pounds and inches are approximate. The British yard measure is also used in the sale of piece goods.

Communications.—The vessels of the British India Steam Navigation Co.'s subsidiary mail service between Bombay and Basra call weekly on their passages both up and down the gulf. Vessels of the Bombay-Persia, Arab Steamers, Bucknall Steamship, Anglo-Algerian, and West Hartlepool also call occasionally.

Bandar Abbas has telegraphic communication by cable with all parts, but there is no land line into the interior. Consequently messages for places in the interior are sent through Abu Shahr, and for India via Henjam, cable rates being charged.

There is a British post and telegraphic office in the compound of the consulate. There is telephonic communication with Henjam.

Goods are sent to the interior by camel, donkey, and also, but seldom, by mule caravan.

The coast from Bandar Abbas town trends southwestward 5 miles to a low sandy point on the northern side of the eastern entrance to Clarence Strait. Suru (Súru), about 2¼ miles southwestward of the pier, is a small village with a fort and date grove; there is a large, conspicuous white house near its northwestern end.

Jezirat Larak, 9½ miles south-southwestward of Jezirat Hormuz, is 5½ miles long east-northeast and west-southwest, 3½ miles broad, and oval in shape, with a low sandy point projecting on the northern side. It is generally barren, with rugged hills; the highest peak, 1¼ miles southward of the northern point, is 510 feet high, and square in shape. A conical peak, 450 feet high, 1 mile farther southwestward, shows best when bearing between south and east.

On the north coast of Larak, nearly 2 miles eastward of the low point, is an old Dutch fort (lat. 26° 53′, long. 56° 22′) and a little village (Labtiyab) containing about 80 men of Ash Shuhiyin tribe, who are fishermen and exceedingly poor. In the interior of the island are about 40 wandering herdsmen. The villagers take their fish, ghi, etc., to Kishm for barter. There is but little water in the reservoirs. The island is covered with stunted vegetation and a few small date trees near the village.

Larak is steep-to, having 15 fathoms, generally, at the distance of ½ mile, and, on the southern side, 40 fathoms close outside that distance, but the shore reef extends 800 yards from the west coast. A bank extends 12 or 13 miles southwestward from the island, with from 25 to 30 fathoms between it and the coast of Kishm; the least water on it is said to be 12 fathoms.

Larak and Hormuz present a very similar appearance on northwesterly bearings at night. The soundings at similar distances southeastward of Larak are deeper than those southeastward of Hormuz.

Anchorage.—There is anchorage on the north coast of the island between the low point and the village, in 13 fathoms, about ½ mile off-shore, and 600 yards from the sands, which dry off some distance; off the village the bottom is rock and the coast reef extends about 200 yards. The anchorage is sheltered only from the shamal, and is not recommended.

Kishm Island (Jezirat at Tawila).—Kishm, the largest island in the gulf, is 60 miles long east-northeast and west-southwest; its greatest breadth is 19 miles, but its western half is generally about 6 miles broad. Its eastern end is 9½ miles southwestward of Jezirat Hormuz, and the island lies nearly parallel with the coast, from which it is separated by Clarence Strait.

It rises in light-colored table-topped hills, with precipitous broken-down sides, often remarkable in appearance.

The climate is exceedingly trying from May to October, inclusive. There are a few towns and numerous villages on the island, and its population was estimated, in 1901, at between 35,000 and 40,000.

The population is for the most part poor, and only trade in the barest necessaries of life.

There is much game on the island, wild goats, partridges, and rock pigeons in the hills, and abundance of small antelopes or gazelles on the plains.

Kishm (lat. 26° 57′, long. 56° 17′), on the northeastern point of the island, was a large and well-built Arab town, with several high wind towers (called bad-gir), which are peculiar to the Persian side of the gulf; recently, however, earthquakes have destroyed half the town and the wind towers. In 1901 it was estimated to consist of about 1,700 houses, with a population of about 6,000. Near the southern end is an old Portuguese fort, conspicuous from seaward; the highest building in the town is from 50 to 60 feet high.

There is a small date grove on either side of the town, and a short distance to the southward are several domed water reservoirs; in dry seasons these reservoirs fail, and, in extreme cases, the wells also. Water, which seems to be fairly plentiful in the island, has then to be brought to the town.

The Shaikh of Kishm, subject to the deputy-governor of Bandar Abbas, exercises authority over all towns and villages on the island.

The land behind the town, and to the southward of it, rises in a gradual slope, ending northwestward in precipitous broken ground. The highest part is a tableland, 560 feet high, 3 miles westward of the town. Much common pottery is made here from the clay of the island. Many bagalas belong to the port.

Shoals.—Eastward of the town are several banks of rock and sand, with 2 and 3 fathoms water, the outermost of which is 1¼ miles off-shore; this shoal is steep-to on the outside, and has from 3¼ to 7 fathoms between it and the beach. There is a 2½-fathom rocky patch ¼ mile eastward of the town, with 7 fathoms close-to, and also a 2½-fathom sand patch 1 mile southeastward of the town. Shoal water extends 1,200 yards off-shore, 1¼ miles southward of the town. The shoals are marked by discolored water.

Lghtbuoy.—A lightbuoy, exhibiting a flashing white light, is moored 1¼ miles eastward of Kishm fort. The lightbuoy is situated within the outermost shoal, the southern end of which has a depth of only 2 fathoms, at a distance of 350 yards, 135° from the lightbuoy.

Anchorage.—Vessels of moderate draft anchor with the fort bearing 180° distant about ¾ mile, in 5 fathoms, mud; approach this anchorage from the northward, passing over a flat with from 3¼ to 3½ fathoms water, which extends apparently parallel to the shore

for some miles northwestward. The water shoals very quickly toward the flat off the town. Vessels of heavy draft anchor about 2 miles off-shore in 6 fathoms, and there is anchorage anywhere northward to the bank bordering the mainland.

Anchorage is prohibited between lines drawn north-northeastward from about 800 yards, and 1¼ miles northwestward of the fort (dotted lines on chart).

The anchorage near the town is well sheltered in a shamal, and there is no heavy sea with a nashi, but the tidal currents cause a vessel to lie broadside to the wind and to ride uneasily.

Tides and tidal currents.—It is high water, full and change, at Kishm, at 9h. 0m.; springs rise 12 feet. The tidal currents off the town and over the shoal banks are strong, 2 knots at springs, with ripples; they are reported to turn about ½ hour before and 5½ hours after high water, slack water lasting about an hour.

Directions.—Pass on either side of Larak, avoiding the shoal extending 800 yards from its western side, and round the eastern end of Kishm Island at a distance of about 2¼ miles to clear the shoals off the town, until the fort bears 210°, when turn southwestward and southward to the anchorage. Or, when Kishm fort flagstaff bears 292°, keep it so until abreast the lightbuoy; then steer northwestward and westward between the shoals to the anchorage, using the plan for the guide; caution is necessary. The coast southward of the town can be approached to a mile until near the outlying patches, but the water shoals quickly toward the coast reef.

Supplies.—Meat, vegetables, and bread, also cattle, can be obtained. Fairly good water can be procured from wells.

Pilots for Clarence Strait can be obtained here.

The coast of Kishm Island, from Kishm town, trends southward 1½ miles; it then trends westward 5 miles and southwestward 20 miles to Ras Khargu. Westward of the tableland westward of Kishm a low plain extends several miles across the island. Westward of the plain there are again table hills, which decrease in height toward Ras Khargu and are precipitous seaward; a square-shaped hill about 500 feet high, northwestward of Shūza, is the only one distinguishable.

The shore of the deep bay, which is about 8 miles across, southwestward of the hills in the eastern part of the island, is low and sandy, but the coast farther southwestward is rocky in patches, with small sandy beaches between, as far as Ras Khargu.

The coast is open to the shamal, which here blows from between southwest and west-southwest.

Depths.—There is a depth of 15 fathoms about 1 mile from this part of the island, which may be approached to that distance. Farther off-shore the water deepens.

Shoals.—Patrick Stewart Patch, of 18 fathoms, 8¼ miles, 151°, from Shuza, is small, with deeper water around. About 1,800 yards, 200°, from Shuza is a shoal (lat. 26° 46′, long. 56° 5′) on which, toward low water, the sea breaks in moderate weather; its position has not been accurately fixed.

Islet.—About 12 miles southwestward of the eastern point of the island is a little flat rocky islet, with vertical sides, lying 600 yards off a rocky point; within the islet is a small bay with 1½ fathoms water, in which native boats shelter in shamals; 1 mile northeastward of the islet are two or three small rocks, about 800 yards offshore, with foul ground inside them.

Shuza (Suzeh), on the coast, 2 miles southwestward of the islet just mentioned, is a village with a date grove and a population of about 500; it possesses about 40 trading dhows but sends no boats to the pearl fishery. Most of its population goes to Minau in the hot season. About ½ mile eastward of the village is a ruined tomb or mosque with a dome.

Masan, a village with about 50 men, stands on the coast 6 miles southwestward of Shuza. There are date trees here, and an old mosque with ruins inland.

Ras Khargu (Khargu) is low and rocky, rising in broken ground to the hills. A little eastward of the ras is a whitewashed cairn, 7 feet high.

Shoal water of less than 3 fathoms extends 600 yards off the coast eastward of the ras, and rocky uneven ground, with less than 3 fathoms to the southward. A shoal, with 3¼ fathoms least water, and 1,400 yards in extent, east and west, known as Maundrell Shoal, lies about 1¼ miles, 130°, from the ras. It is not advisable to pass inside this shoal.

The coast of Kishm Island trends west-northwestward ¾ mile fom Ras Khargu, whence it turns northward and northwestward 3 miles, and then westward and southwestward 8 miles to Ras Salak; from near Ras Khargu to Ras Salak, the coast is low and sandy. On the 5-fathom bank, on the outer part of which there are several shoal heads, with from 2½ to 3¼ fathoms over them, extends about 800 yards from the shore. Bevan Patch, with 2¼ fathoms least water, lies about 1¼ miles northwestward from the ras, and ½ mile from the Kishm Island shore. Deristan Bay lies between Ras Khargu and Ras Salak.

Jezirat Henjam (Hanjam), nearly 1 mile southwestward of Ras Khargu, the channel between being known as Henjam Sound, is nearly 5 miles long north-northeast and south-southwest, 2½ miles broad, barren, hilly, and covered with coarse grass and brushwood. Near the northern end is a remarkable table hill (lat. 26° 40′, long.

55° 54′), 350 feet high, which does not show well seen from the southward against the land; on its summit is an inconspicuous whitewashed stone cairn 7 feet in height.

On the summit, 241 feet high, of Jabal Mushi, about 800 yards north-northwestward of Table Hill Cairn, is an inconspicuous whitewashed stone cairn 10 feet in height. The northwestern side of Jabal Mushi is a conspicuous cliff.

The island is rather dark in color, and the hills, which are either rounded or of peaked shape, decrease in height toward the comparatively low southern end of the island.

There are two small ruined mosques near Ras al Mashia, the north point of the island; the eastern is white, the other red.

There are two whitewashed cairns, 5 feet high, on the island, about 2 miles and 1.3 miles southeastward of Ras al Mashia.

There are two whitewashed marks, shown on the chart, on and near Ras Buser, westward of Ras al Mashia, which have been replaced by cairns 10 feet high.

There is a village, about 30 houses with date groves, on the western side of the island, and a much larger Arab village near the southern point; the male inhabitants of the island, who number about 450, own some 40 pearl boats and keep goats.

The coast is rocky points, with little cliffs, and sand beaches between, except Ras al Mashia, which is low sand, and a shoal spit extends 150 yards northeastward of it, with 12 fathoms at the distance of 200 yards. The 5-fathom curve is about 1,400 yards from the coast, 1¾ miles southeastward of Ras al Mashia. Shoal water extends about 1,400 yards off the northwestern part of the island, and about 400 yards elsewhere; it is fairly steep-to.

There are depths of 30 fathoms 1 mile off the south coast and from 5½ to 14 fathoms in the sound, but in the middle of the southeastern entrance to the sound is a 5¼-fathom patch. The depths northward of the island are somewhat irregular, varying from 6 to 20 fathoms; between the island and Ras Salak there are 6 and 7 fathoms, the bottom being even.

Shoal.—A shoal, known as Mushi Patch, about 200 yards in extent, with 3¼ fathoms water, sand bottom, lies 1 mile, 300°, from Ras al Mashia.

Light.—A fixed white light is exhibited, at 128 feet above high water, from the northeast corner of the telegraph office, situated about 750 yards southward of Ras al Mashia, and should be seen from a distance of 5 miles. For the arc of visibility, see Light List, and chart.

Beacon off Ras al Mashia consists of three superimposed concrete blocks surmounted by a staff and triangle, supported by struts,

painted white, and 25 feet in height above the sand. It is proposed to establish a light on the beacon.

Buoys.—There are two mooring buoys for the use of the Government launch, one on the eastern side of Ras al Mashia and the other on the western side.

Anchorage.—Bandar Gharbi is the anchorage northwestward of Ras al Mashia. Anchorage in Bandar Gharbi, with Ras al Mashia Beacon (lat. 26° 41′, long. 55° 54′) bearing about 124°, distant about 800 yards, in from 7 to 9 fathoms water, is generally preferable, the bottom being more regular; this anchorage is partly sheltered from the shamal, which here blows from the southwestward.

Vessels should not anchor in the locality of Bandi Sharki.

It is unadvisable to anchor southwestward of a line drawn 303° from about 50 yards southwestward of Ras al Mashia beacon (pecked line on chart), nor on a line drawn east-northeastward from the ras to cable-house on Kishm Island.

Tides and tidal currents.—It is high water, full and change, at Jezirat Henjam anchorage, at 9 h. 30 m.; springs rise 10¼ feet, neaps 7¼ feet. There is considerable diurnal inequality, which principally affects the low water of the inferior tide.

During springs, the currents set westward from 4½ hours before till 1½ hours after high water, and eastward from 1½ hours after high water till 4½ hours before the next high water, and attain a rate of from 2 to 3 knots.

It is high water, full and change, in Henjam Sound, at 9 h. 03 m.; springs rise 9 feet and neaps rise 7 feet above datum of soundings. Springs range 7¼ feet, neaps 3¼ feet.

In Henjam Sound the current runs to the northwestward from 2 hours before to 2 hours after high water at Maskat, and to the southeastward from 4 hours after to 4 hours before high water.

In the eastern entrance to the sound the currents are very strong.

Directions.—The southeastern entrance to Henjam Sound is about 500 yards wide between the 5-fathom curve on each side; the beacon on Ras al Mashia, bearing 296°, leads in, but near the 5¼-fathom patch in the fairway. When Table Hill bears 270°, steer 304° to the anchorage in Bandar Sharki.

Avoid the detached patches about 1 mile west-northwestward of the cable-house on Kishm Island. The northwestern coast of Jezirat Henjam must not be approached nearer than about 1 mile, as the rocky flat extending off it has from 5 to 8 fathoms close-to, and the 5¼-fathom shoal above mentioned must be avoided. The water shoals regularly in Deristan Bay. Ras Salak (lat. 26° 41′., long. 55° 46′) can be approached to ½ mile. In a shamal it is best to enter the anchorage from the eastward.

When entering Henjam Sound from the southeastward, it is recommended to keep well to the southward of Maundrell Shoal, and to enter with the cable-house in range with the left edge of the "Tall palms," bearing 340°, which is said to be a good mark, altering course in good time to the westward in order to avoid the foul ground southward of Ras Khargu.

Caution.—The southeastern approach to Henjam Anchorage should be used with great caution by vessels of 20 feet draft and over.

Lloyd's signal station.—There is a Lloyd's signal station at Henjam, with which vessels can communicate by the International code; no look-out, however, is kept, and vessels desiring to communicate must first attract attention by the steam siren or otherwise. The station is under the Indo-European Telegraph Co., and the British flag is shown here.

A mast, 205 feet in height above the ground, is situated about 200 yards, northwestward, from the flagstaff (British) at the telegraph station. There are two secondary masts near it.

Supplies.—After rain some water can be obtained from the ruined reservoir at the north end of the island, and there is a well of fairly good water about a quarter of a mile from the southeastern point of the island, near the village. Oysters can be taken from the rocks at low water. A small quantity of provisions might be obtained.

Communication.—The vessels of the British India Steam Navigation Co.'s subsidiary mail service between Bombay and Basra call at Henjam weekly, on their passages both up and down the gulf.

Deristan, on Kishm Island, 3½ miles northward of Bas Khargu and 1¼ miles inland, is a village with about 800 men, who possess a few boats; there are some date trees in the vicinity. Quoin hill, long and remarkable, extends eastward from the bluff, which is situated about 5¾ miles westward of the village; between it and the hills northward of Ras Khargu is a large swampy plain.

Ras Salak (Salagh) is sandy, with a rocky beach; the hills here are about 2 miles inland.

The coast from Ras Salak trends west-southwestward 27 miles to Ras Dastakan, the southwestern point of Kishm Island. Westward of Ras Salak is a small bay on the shore of which, 2½ miles from the ras, is Salak fishing village, with about 30 men; here there are a few date trees and some wells.

Ras Tarkun, 8 miles west-southwestward of Ras Salak, is rocky, and 7¼ miles farther west-southwestward is a point where the land rises steeply to the hills.

Kishkuh, 4 miles west-northwestward of Ras Tarkun, is 1,300 feet high, with a small table top, and noticeable. A range of dark hills, largely composed of salt, runs north and south across the island 3

miles westward of Kishkuh. There are extensive salt caves at Namakdan, the southern end of the range, and the brine from them runs out on to the plain between the caves and the sea, where, on evaporating, it leaves a large deposit of salt, which is taken by boats to Linga and places on the Arabian coast.

Rock.—A rock, with a depth of 5 feet, exists at about 1 mile eastward of Ras Tarkun. Position, lat. 26° 38′, long. 55° 39′.

The coast from Namakdan is hilly about 5 miles westward to Kawuni, a small village 1 mile inland, with a few date trees near, and a table hill, 550 feet high, 1 mile north-northwestward of it; thence to Ras Dastakan there is a plain between the hills and the coast, on which, about 1½ miles northeastward of the ras, is the small village Dastakan. There are two shallow bays within about 4 miles east-northeastward of the ras.

The Hummocks, 2½ miles north-northeastward of Ras Dastakan, and three remarkable hills. The western Hummock, 2 miles north-northwestward of the ras, is table-topped; the middle one has a rounded summit, and the eastern and highest (lat. 26° 35′ long. 55° 20′), 2¾ miles east-northeastward of the western, is 585 feet high, and table-topped; the southern sides of the Hummocks are precipitious, and the eastern is nearly joined to a tableland, the southern side of which is precipitous, extending 4 miles east-northeastward, and ending in a bluff.

Ras Dastakan is low and rocky. The coast here turns northward, 7¼ miles, to Basidu Point (lat. 26° 39′, long. 55° 16′); it is low, except near the Hummocks, where it rises to some broken rocky hills, and it is bordered by a flat of mud and sand, which, about 2 miles southward of Basidu Point, is 2 miles wide.

Soundings.—The soundings from Henjam to Namakdan are regular, the 20-fathom curve being from 5 to 9 miles offshore; the 20-fathom curve is from 9 to 11½ miles off-shore between Namakdan and Ras Dastakan.

The Flat (Basidu Flat) is a bank, with from 2 to 3 fathoms water, off the southwestern part of Kishm Island; it commences about 4 miles southward of Namakdan, and extends about 18 miles westward, and its outer edge is 9 miles off the south coast and 5½ miles off the west coast of the island. The 5-fathom curve from about 7 miles eastward of Namakdan trends southwestward, passing close southward of the 3-fathom curve of the bank, and thence turns west-northwestward toward Linga. The 20-fathom curve is from 1 to 2½ miles outside the 5-fathom curve on the southeastern and southern sides of the bank, and from 5 to 8 miles outside it on the southwestern side. Discolored water extends some distance outside the bank.

There is a narrow navigable channel between the Flat and Kishm Island; it passes near the coast from Kawuni to Ras Dastakan, and thence southward of the tail of Beacon Shoal into the channel leading to Basidu anchorage; it appears to have a least depth of about 4 fathoms. Directions are given later.

Mariner Shoal.—There is a least depth of 4 fathoms on this shoal, situated 7¾ miles, 321° from Jezirat Tanb Lighthouse, surrounded by uneven depths from 6 to 9 fathoms. It is advisable to avoid this locality.

Tidal currents.—On the Flat, clear of the island, the currents set west-southwestward from 3 hours before until 3 hours after high water, and east-southwestward from 3 hours after high water until 3 hours before the next high water; the currents attain rates of from 1 to 2 knots.

The set of the currents through the channel northward of the Flat is not known, but the currents appear to follow its direction.

Southward of the Flat, and between it and Jezirat Tanb, the streams set eastward and westward, and attain a velocity of from 2 to 3 knots at springs.

Clarence Strait is the channel between Kishm Island and the main; it is navigable from the eastward for vessels of deep draft as far as Laft Point, but as the tides are strong and the channel is not buoyed it is inadvisable to attempt the passage without a local pilot.

The western part of the strait, from Laft Point to Basidu, is not yet completely surveyed.

The north shore of Clarence Strait trends westward to Birkeh Band-i-ali, a conspicuous dome-shaped reservoir; Siru Spit, 4 miles southwestward of Bandar Abbas, forms an island at high water 1½ miles long and 8 feet high at its eastern point. The island is about 1½ miles southwestward of Siru village.

A bank of hard sand extends for 1½ miles parallel to the shore between Siru and Chiju.

The Keneh Surkh range of hills, about 5 miles from the coast rises gradually from the westward to a height of about 1,500 feet.

From Birkeh Band-i-ali, past the village of Khun Surkh, the coast trends southwestward for 3 miles, to a sandy point off Khor Kanari, a small river which dries at low water; thence it runs southwestward to Bustaneh Point, which is low, and not easily distinguished, although it has a hillock about 20 feet high on its eastern corner.

Bustaneh is a thriving village of some importance, and there is good anchorage off it for large vessels, protection being afforded by the east and west Bustaneh banks. Throughout this reach the holding ground is good, being mostly of sand and mud.

The low line eastward of the village dries from ½ mile to 1,500 wards and is fairly steep.

The Koh-i-Namak Sar range of hills lies from about ½ to 3 miles northward of Bustaneh Point, and is a confused mass of irregular and precipitous peaks; the summit of the range is 930 feet in height, and there is a peak behind of 1,230 feet.

The high line from Bustaneh Point, westward, for many miles is indefinable, and the sea overflows the extensive mud flats at spring tides.

Pul or Puhal Point, 13 miles westward of Bustaneh Point, is a low projection only 1½ miles from the Kishm shore, on the other side of the strait; on it are some ruined birkels or water tanks, and about 500 yards to the northeastward is a conspicuous tree, which forms a range mark for vessels approaching through the narrows. On the eastern side of the point, 2 miles distant, Rud-i-kul River, the water of which is extremely salt, flows into the strait over the mud flats, and is navigable only for small craft.

There is completely sheltered anchorage off Pul Point, which has a frontage of 350 yards, and vessels can, apparently, lie in 5 fathoms near the shore, but the tidal currents are said to attain a rate of 2½ knots, and the holding ground is bad.

Paul, or Puhal, village (lat. 25° 58′, long. 55° 45′), situated some 2 miles northward of Pul Point, is a number of scattered group of houses extending in an east and west direction across the plain. There are about 150 houses, but in September, 1913, they were practically all deserted, and the few remaining inhabitants were living in small reed huts and tending date plantations.

This part of the country appears to be subject to raids during the cold season, when the inhabitants cross to Kishm Island for safety.

The south shore of the strait from the eastern end of Kishm Island trends to the west-northwestward for 4 miles, to a point which rises to a table hill about 100 feet high, and off which a sand spit dries out to a distance of 600 yards. From the 100-foot hill the coast trends westward and west-southwestward for 19 miles.

Khor Tawala, on the western side of the 100-foot hill, is a small backwater running into the lowlands northward of Kishm Great Table hill, where the native boats are hauled up.

The two small Dukuhak islets, 80 and 100 feet high, are on the western side of the entrance of Khor Tawala.

Two miles westward of the Khor near the coast, is a conspicuous peaked precipitous hill, called Jebel Salsul, 430 feet high; ¾ mile north-northwestward of Jebel Salsul is Milne head, a bold promontory 225 feet high.

About 6¼ miles westward of the Table hill (100 feet) point is a remarkable quoin hill 454 feet high, with a small tree on its summit, known as Jebel Horton, the bluff of which faces southward.

Between Kohr Tawala and Jebel Horton the shore is fringed by a shoal with from 6 feet to 2 fathoms of water, and steep-to; its eastern part extends 2 miles off-shore, but near Jebel Horton it is only about ½ mile-off.

Bandar Salsul, between the low point and Jebel Horton, is a slightly receding shallow bay where boats anchor in a northeast wind.

Darguwan, about 1½ miles southwestward of Jebel Horton, is a small village inhabited by fishermen, and there are a few date palms in the vicinity. The coast from Darguwan trends west-southwestward for 5 miles, to a well-defined point called Kuwai, upon which there is a hill 50 feet high; there is a small cove on the east side of the hill.

The village of Kuwai lies a mile eastward of Kuwai Point; there is a date grove near the village, and a birkeh and a ruined mosque near the shore.

About 1½ miles southwestward of Kuwai Point, where the small village of Mughara lies, is Zainubi Point, the eastern end of a plateau 180 feet high.

Zainubi Village stands in a thick date grove 1½ miles inland, and 3 miles southwestward of Kuwai.

The great tableland of Zainubi, 1¾ miles southward of Kuwai, is 4 mlies in length, with a gap in its western portion, and is from 300 to 500 feet in height.

Biscoe Bay.—From Kuwai Point to Alla Mulk Point, a distance of 17 miles, the coast recedes into a long bay in which the low line dries from 500 yards to ½ mile; the western end of this bay is flanked by Alla Mulk Reef and a rocky bank extends from it for 9 miles, which lies from ½ mile to 1 mile from the shore; there is a very narrow passage between this reef and the shore, fit only for native craft. Paipusht is a village with about 100 men belonging to it, chiefly boatbuilders who work at Kishm; it is built on the northern slope of the Biscoe Range, at about 1½ miles from the coast.

It shows up well when the sun is shining on it, but at other times is difficult to see.

Biscoe Range.—This range extends from Paipusht Village in a curve southward and westward for about 8 miles; it has several good summits, useful as landmarks. Jebel Biscoe, 965 feet high, is the highest, and has a fine sloped summit; Finger Peak, 902 feet high, is conspicuous by its finger-shaped summit.

Coastal range.—To the westward of Paipusht is a coastal range from ½ to 1 mile from the coast; it is broken up into irregular masses, and a series of detached quoin-shaped hills.

Close to the beach there are no conspicuous summits except a conical hill, 350 feet high, toward the western end of the range, called Sugar-loaf, and another small hill, 185 feet high, named Jebel Arab, nearer the coast and a little farther westward of Sugar-loaf Hill.

Alla Mulk Point is at the western end of Biscoe Bay; it runs down from a rocky plateau 110 feet in height. The village of Alla Mulk, comprising a small fort and a few trees, lies just southward of the plateau, and ¾ mile to the southeastward there is a date plantation with a small house. The coast from Alla Mulk Point runs in a westerly direction for about 1¼ miles to Laft Kedim Point, and then curves round in a west-southwesterly direction to Laft Point.

Between Alla Mulk Point and Laft Kedim Point are the villages of Kahura and Geshirn; there is a small mosque just eastward of Laft Kedim Point, and close to the beach just northward of it is a birkeh, both of which are fairly conspicuous. There is also a date plantation.

Laft Point.—About 2 miles west-southwestward of Laft Kedim Point there is a low hill just inside the point; its summit forms a good mark for anchoring.

About ½ mile northeastward of the point is a rocky plateau, the northeast corner of which is 63 feet high. There is a well-protected anchorage off the point, the bottom being, in places, of mud and sand, with depths of 3½ to 4 fathoms within 400 yards of the point.

Tidal currents run through the strait at this point at the rate of about 2 knots at springs.

At Laft Point the strait divides into two channels; the eastern branch, narrow and devious, flows southward, the other, continuing to the westward for 3 miles, turns abruptly to the southwestward, the two reuniting off the village of Guran.

Meherhuni Hill, 585 feet high, 2¼ miles southward of Alla Mulk Point, is conspicuous from the eastward.

Shaik Musa, 270 feet high, about 1 mile southward of Alla Mulk Point, is conspicuous; its eastern perpendicular face is a good range mark coming through the strait from the eastward.

Middle Grounds—Bustaneh Banks.—These banks extend for 8½ miles, and lie from 2 to 3 miles off the Bustaneh shore; the west bank dries in a small patch about 4 feet high at springs, and the east bank is sometimes just awash.

Fishing ground.—About 2 miles northeastward of Kuwai Point is a small shoal area of hard sand, with a least depth of 4½ fathoms over it, which is the principal fishing ground in the strait.

Middle Banks.—These banks, which dry in patches, extend for 8 miles at from 1½ to 2 miles off the Kishm shore, commencing west-northwestward of Kuwai Point to the northward of Jebel Arab. There is a deep channel northward of these banks, but it is narrow and intricate, and should not be attempted.

Alla Mulk Reef.—A reef a little over ½ mile in length, which dries 4 feet, lies about 600 yards from the shore 1 mile east-southeastward of Alla Mulk Point.

From the reef a narrow rocky bank, with the less than 3 fathoms on it, extends for 9 miles east-southeastward close to the shore of Biscoe Bay.

Alla Shoals.—Two rocky patches lie about 1¼ miles northwestward of Alla Mulk Point; the northern one has a least depth of 3¾ fathoms over it, while the southern one has 3½ fathoms.

Pul, or Putal Patch, 1,300 yards east-southeastward of Pul Point, is a small rocky patch with 3¾ fathoms over it.

Low Point.—The bank of this point dries for ½ mile in a northeasterly direction, and shoal water continues for a further ½ mile. The navigable channel of Clarence Strait lies northward of Bandar Salsul Flat, where there are depths of from 6½ to 13 fathoms. Hereabout the channel is 3 miles wide, and commences to contract at the Bustaneh Banks.

The Bustaneh and Middle Banks commence to the northward of Kuwai Plateau, and between there is a pass 1¼ miles wide. The depth along the southern edge of Bustaneh Banks is about 6 fathoms; the waters to the northward are navigable, but very intricate.

Mountains.—On the mainland side of Clarence Strait is the great chain of mountains which terminates eastward in Jabal Ginao (lat. 27° 24′, long. 56° 8′).

A mountain, 5,120 feet high, with two great steps or notches on its western side, is situated 18 miles west-southwestward of Jabal Ginao; and a peak of the same range, 9,200 feet high, and covered with snow in winter, is situated 55 miles westward of Jabal Ginao, and is visible over the other mountains from seaward; from the southward it shows three little peaks. Between this lofty range and the sea a range of mountains, about 1,000 feet high, extends about 20 miles westward from Bandar Abbas.

A mountain range commences 11½ miles northeastward from Khamir town, and runs westward; there is a great valley between this range and the range running westward from Bandar Abbas. Khamir Peak, 8 miles northeastward of Khamir Town, is 3,700 feet high and pointed; West Peak, of the same range, 13 miles to the westward, is much higher, but not conspicuous in shape; a spur of the range extends southeastward from it.

A range commences 10 miles northward of Basidu Point, and trends a great distance westward. There is a wide valley between this and the Khamir Range, where the land bordering the strait is low and swampy, with a great growth of mangroves, probably the delta of a small river.

The north shore from Pul Point trends west-southwestward some 10 miles. About 3½ miles westward of Pul Point is the eastern end of a low island, which is 2½ miles long, and about ½ mile offshore, with deep water close to the south coast, but no passage to the northward.

There is said to be a narrow channel, with not less than 4 fathoms water, about 600 to 800 yards southward of the island, leading into Khamir backwater, which appears to have more water than charted, soundings of 6 fathoms having been obtained in it. Anchorage has been obtained about ½ mile southeastward of the shore at Khamir in 3½ fathoms water. A small creek leads into the backwater from the southward.

Khamir Town (lat. 26° 57′, long. 55° 36′), on the mainland 8½ miles westward of Pul Point, has a fort with a high square tower; the town contains about 200 men and is outside the walls of the fort; there is a date grove eastward of it. The town lies ½ mile inland, and there is a building on the shore. The chief export is "gatch," a kind of fine white plaster; millstones also are exported. The sulphur mines are in small hills near the foot of the mountains, about 3 miles westward of the town, and some years ago were said to be nearly exhausted; they are not now worked.

The shore from Khamir backwater trends generally south-southwestward 12½ miles, then westward 6 miles, and then northwestward 4 miles to the northeastern part of a shallow bay; it has not been traced, and is extensive mangrove swamps, intersected by numerous creeks, fronted by mud-flats and shoals. There are two pyramidal hills about 150 feet high in the plain, 2 and 3 miles west-southwestward from Khamir town, and a short distance from the swamp.

The northern shore of the shallow bay just mentioned rises steeply to mountains, 2,940 feet high, which are rugged, barren, and almost inaccessible; in the northwestern corner of the bay is a picturesque gorge in which are sulphur springs, and from it the west shore of the bay trends southward 3 miles to a low point situated 4¾ miles northwestward of Basidu Point. Birka Sifla (Birkeh Siflin), on the shore, 1 mile southward of the sulphur springs, is a small village and date grove; and there are date trees and many ruined tanks on the point.

The south shore of the strait from Laft Kedim trends west-southwestward 1¼ miles to Laft Point, which is low, but the land to the southward rises gently to the height of about 60 feet.

There is anchorage off Laft Point, sheltered from all winds, the water being fairly deep close to the point, sand and shells bottom. The tidal currents here attain a rate of about 2 knots at springs.

The coast of Kishm Island from Laft Point trends southeastward and southward 7 miles, and then generally west-southwestward, 30 miles to Basidu Point. The strait is about 6 miles wide westward of Laft Point, but it is very much obstructed by banks of mud, sand, and mangrove swamps. There are two channels for about 15 miles southwestward of Laft Point, which reunite westward of Guran village.

Khur Guran, the eastern of the two navigable channels westward of Laft Point (lat. 26° 56′, long. 55° 44′), is not less than 600 yards wide, except at the sharp turn from northwest to southwest in its southern part, where it is 400 yards wide; it is generally preferred by pilots, as there are not less than 5 fathoms throughout, and, except at the western entrance, the banks are well defined by the mangroves. Its course is tortuous, being southward 9 miles from Laft Point, passing about 2 miles westward of that town; thence northwestward 2½ miles; then turning sharply southwestward 5 miles and south-southwestward 2 miles to Guran Village, whence it trends west-southwestward 2 miles into Khur Masaga. The last reach is the most difficult part of the passage as it is very narrow, and several large bagalas are sometimes moored off the village; the banks cover at high water, and they are not marked by mangroves.

Fishing stakes extend half way across the channel extending southwestward between the two mangrove islands northward of Guran.

Laft, 3 miles southeastward of Laft Point, is a town with about 800 or 900 men. It lies at the foot of a hill, 200 feet high, rising from the beach to cliffs; there is a ruined fort with three towers at the southern end of the town. Laft has some trade; much firewood is cut in the swamps and exported, and many bagalas from Linga, etc., are repaired and some are built.

Laft Creek, in which native vessels lie, runs southeastward along the shore to the town. Its entrance is at the southern end of Hindarabi, a low islet, which has a small white tomb on its northern end, 1 mile southward of Laft Point. The creek is narrow, and there are mud banks with mangrove bushes between it and Khur Guran.

There is a remarkable hill, from 500 to 600 feet high, 1 mile east-northeast of Laft town, which is said to have ruins of reservoirs, etc., on its summit.

Supplies.—There is fresh water at Laft, but only in reservoirs; a few cattle and some poultry can sometimes be obtained. Good fish are caught here and at other places in the strait, much of which is salted and exported.

Guran is a small village resorted to by many bagalas for firewood, which is exported to all parts of the gulf; large quantities are stacked ready for shipment.

Khur Masaga is the western branch of Clarence Strait; it is seldom used by pilots, though it is wider than Khur Guran, but the banks on either side are often steep-to, and, being covered, do not show in the muddy water. In places the navigable channel is but 800 yards wide; the least water in the fairway is said to be 5 fathoms, but, in January, a British naval vessel was taken through this channel by a pilot from Kishm, and the least water found was 3½ fathoms; the pilot appeared to use range marks. A pilot stated in 1912 that this channel has silted up, and can only be used by small bagalas. The direction of the khur from abreast of Pul Point is westward 5½ miles, and then south-southwestward 14 miles to the entrance to Khur Guran.

Southward of the low island, 3½ miles westward of Pul Point, with a channel ½ mile wide between, is a mud flat or shoal about 6 miles long. Caution is necessary to avoid the northeastern extremity of the shoal when proceeding westward from Pul Point.

Clarence Strait, from westward of Guran to Basidu, is called Khur Jafuri by the natives. It trends west-southwestward and westward 16 miles to Basidu Point.

Villages.—There are several villages between Guran and Basidu, all of which have date groves and are a short distance inland. Chahu is about 7 miles westward of Guran; Dulu and Tersai are 3 miles and Kunar Siya (Siyah) 4 miles farther westward; they are small and inhabited chiefly by fishermen, and are not visible from the strait, but a white tomb near Chahu can be seen.

Diraku is 1¾ miles west-southwestward from Kunar Siya and stands on rising ground; Nacconas Point slightly projects between these villages and is low. Guri, 2 miles west-southwestward from Diraku, is large, with extensive date groves and much cultivation, and a pass leads from it through the hills to the south coast of Kishm. The inhabitants of these two villages, being agricultural, supply Basidu with fruit and vegetables; both villages are visible from the strait.

The shore from Guri is low and barren to Kalat Hajji Karitu, a ruined fort on a small, rocky mound close to the strait, 3 miles westward. Nakhlistan, or Old Basidu, lies southwestward of this mound; here there is a large date plantation with a few houses and some wells of good water.

Flat.—A mud flat, which nearly all dries, commences at Guran and extends from 400 yards to 1 mile from the southern shore in places, westward to Basidu Point, a distance of 18 miles. A middle

ground extends from 1¾ miles northward of the shore 1¼ miles westward of Diraku (lat. 26° 39′, long. 55° 24′), westward 4 miles, and has from 1½ to 3 fathoms water; the navigable channel, here about 1 mile wide, lies northward of it.

Bank.—On the northern side of the navigable channel an extensive sand bank trends westward from 2¾ miles northwestward of Guran; its distance from the south shore varies from 1¼ miles northward to Chahu to 2 miles northward of Basidu, where it turns southwestward and joins North Bank; it has from 2 feet to 2 fathoms water.

Directions.—A pilot can be obtained at Kishm, but one would probably have to be sent for if starting from Basidu.

It is said that the detached sand banks in the strait are red sand and easily distinguished, although they may have a depth of 3 fathoms, when the water over them is a yellowish green color, and also that the sand banks extending from the shore are usually white sand and do not show as well as the red.

Entering Clarence Strait from the eastward it is necessary to stand sufficiently far to the northward so as to avoid the bank extending northward from Kishm Island, between Table Hill Point and Jebel Horton or Quoin Hill. When westward of the meridian of Quoin Hill and clear of the west end of the bank a course may be set to pass Kuwai Point at a distance of 700 yards, and when Kuwai Point bears 182° steer 255° for Jebel Arab, keeping the perpendicular face of Shaik Musa a little open on the starboard bow. Keep on this course (having regard to the fact that the ebb tide generally sets toward the middle banks) until Sugar-loaf Hill opens out from behind the 320-feet bluff; then alter course to 297° direct for the conspicuous tree on Pul Point. This course will take a vessel toward an anchorage of Pul Point; if proceeding to Laft Point, Pul, Alla, and Ked shoals, off which strong eddies and overfalls may be expected at springs, must be avoided.

Tides.—It is high water, full and change, at Kuwai at 11 h. 10 m.; springs rise 13 feet 2 inches, neaps 11 feet 2 inches.

At Laft Point it is high water at 12 h. 02 m.; springs rise 13½ feet, neaps 10½ feet. The datum is respectively 3 feet and 1 foot 5 inches below mean low-water springs.

In February, 1910, a British naval vessel proceeded westward through the strait to Laft Point without a pilot. After passing Kuwai the northern vertical bluff of the quoin-shaped hill southward of Ala Mulk bearing 262° led southward of the second middle ground until the conspicuous tree on Pul Point bore 293°, which bearing led through the strait until northward of Ala Mulk.

From off Ala Mulk pass about ½ mile off Laft Kedim, and then round Laft Point at a distance of about 600 yards. The bottom

between Ala Mulk and Laft Point is rocky, and anchorage in this locality should be avoided if possible; southward of Laft Point it is generally mud.

From Laft Point proceed by Khur Guran, where the banks are everywhere a guide; the eastern banks are kept aboard. The most difficult places are the very sharp turn from northwest to southwest leading into the direct reach for Guran, sometimes called Acute Bend; off Guran (lat. 26° 44′, long. 55° 36′), where the channel is narrow and several large bagalas are moored in the middle, and at the entrance westward of Guran, where the banks of the khur are covered and not marked by mangroves. The channel westward of Guran is narrow, and the banks are very steep-to. There are fishing stakes on the edge of the southern banks, and they extend westward to the Khur Masaga; they are only just visible at high water. This part of the channel should be navigated at low water when the banks can be seen.

From about 3 miles westward of Guran keep in the fairway of the channel, at distances of from about 1¼ miles to ¾ mile off the south shore till northward of Kunar Siya; then cross over to the north bank and run along its southern side in 5 fathoms, until past the middle ground northeastward of Basidu, whence steer southwestward to Basidu anchorage.

Basidu Point (Básídú) (lat. 26° 39′, long. 55° 16′), the northwestern point of Kishm Island, on which the village is situated, is cliff, 20 feet high, level on the top, with a few small buildings and some date trees. The point is bordered to the distance of about 400 yards by shoal water of less than 3 fathoms, and a rocky patch which nearly dries and has 2½ fathoms water close outside it extends 150 yards northwestward from close off the pier. About 300 yards northwestward of the 3-fathom curve off the point, the Gut, about 200 yards wide, with from 12 to 16 fathoms water, trends northeastward.

Bacon Shoal extends from about 1,200 yards westward of Basidu point, southwestward 3½ miles, with a greatest width of about 800 yards; the northwestern end is rocky, the rest is sand. The shoal for about 100 yards from the northwestern end, and also a large patch about 2 miles father southwestward, dries, and the remainder is covered. A sand spit, also covered, extends 3¼ miles southward from the shoal. Beacon shoal has from 7 to 10 fathoms close to its northwestern side.

The shoal shelters the anchorage from the shamal, which here blows from the southwestward. There is a narrow channel, with from 6 to 11 fathoms water in places, between Beacon Shoal and the mud and sand flat extending off the west coast of Kishm Island, but it is not navigable.

Beacon.—A mast, surmounted by a cask, about 40 feet high, stands on the northeast extremity of Beacon Shoal.

North Bank is a continuation of the shoal extending westward on the north shore of Clarence Strait, and it extends about 6 miles southwestward from 2¾ miles northwestward of Basidu Point, with a breadth of about 1 mile, and depths of from 2 to 3 fathoms. Its southwestern extremity is 6 miles west-southwestward of Basidu Point.

Basidu, southwest approach—Depths.—The approach to Basidu anchorage is between North Bank, on the northwest, and the Flat and Beacon Shoal on the southeast; there is a least depth of about 3½ fathoms in the fairway westward of the Flat, deepening to 6 and 9 fathoms off Beacon Shoal.

Anchorage.—The best anchorage is just southeastward of the Gut, about 600 yards northwestward of the pier, or further northeastward, in from 7 to 5 fathoms water, clay bottom, and good holding ground. Avoid anchoring in the Gut.

It is advisable to moor with the anchors northeast and southwest, as when the wind is strong and opposes the tidal current a vessel at single anchor lies very uneasily and is apt to foul her anchor.

Tides and tidal current.—It is high water, full and change, at Basidu anchorage at 0 h. 0 m.; springs rise 10 feet. The tidal current in the western part of Clarence Strait and Basidu anchorage sets westward from about 1 hour before till about 5 hours after high water, and eastward from about 5 hours after high water until 1 hour before the next high water, at a greatest velocity of about 3 knots at springs. Between Ras Dastakan and Ras Kharyu the east going current sets northwestward, northward, and northeastward, converging to Basidu anchorage; the west going current sets southwestward and westward.

Directions—Basidu anchorage is not recommended for vessels of more than 20 feet draft, and a vessel of more than 17 feet draft should not enter before half flood.

From the eastward, in a steam vessel, pass about 2 miles northward of Jezirat Tanb, avoiding Coote Rock (lat. 26° 17′, long. 55° 25′), from the southward pass on either side of Jezirat Nabiyu Tanb. Then bring Jezirat Nabiyu Tanb about 169° astern and Grubb's Notch, 2,950 feet high, will be ahead, bearing 349°, which leads some 5 miles westward of Mariner Shoal and of the 3-fathom curve of the Flat. When the eastern Hummock bears 72° keep Khamir Peak bearing 45°, which leads in and northwestward of Beacon Shoal; round the beacon at a distance of about ¼ mile and anchor as already directed. The least water on this track is about 3½ fathoms. Grubb's Notch and the Hummocks are good marks.

At night pass about 2 miles northward of Jezirat Tanb and steer westward until the light bears 120°, when steer 300° with the light astern until past Mariner Shoal; then steer north-northwestward and anchor in about 6 fathoms water till daylight; bear in mind that the tidal currents set east and west between Jezirat Tanb and the Flat at a velocity of from 2 to 3 knots at springs.

By day the Flat and Mariner Shoal are indicated by discolored water. Jezirat Tanb and Nabiyu Tanb are good marks. Fishing boats often anchor outside and near the Flat.

From the westward, and about 3 miles southward of Ras Kharyu (lat. 26° 31′, long. 54° 51′) steer east-northeastward until Khamir Peak bears 45°, and then as above directed; attention to the tidal currents is necessary.

At night anchor near the Flat and wait till daylight.

Inner Passage.—To proceed between Kishm Island and the Flat pass about 1 mile southward of the point westward of Namakdan, and steer westward until that point bears 73°; keep this bearing which leads through the narrow part of the channel, on astern until the eastern Hummock bears 315°, when gradually bring the point to bear 71°. Keep this bearing on till ¾ mile southward of Ras Dastakan, and then steer with the table-topped hill, near Al Buza, ahead, bearing 293°; when the mountain, 1,330 feet high, on the mainland northwestward of Basidu, bears 336°, keep this bearing on until Khamir Peak bears 45°, and then as above directed. A British naval vessel passed through this channel in 1912, and the least water obtained was 4¾ fathoms. Caution is necessary in using it, and it will be noticed that 3½ and 4 fathoms are the least depths charted.

Basidu (Básídú), a British possession, is a village on Basidu Point with a population of about 50 in the British concession, and about 300 in the Persian part, most of whom are in a condition of poverty. A small chapel and a hospital on the point are ruins. There are several wells with plenty of water, and three Government reservoirs. About ¼ mile southward of the point is a building known as the Officers' House, with a flagstaff where the British flag is hoisted when any vessels are in the anchorage, a scattered village and a small bazaar; most of the buildings are in a state of decay.

No supplies can be obtained.

Pier.—A stone pier extends 200 feet northwestward from the shore 200 yards northeastward of Basidu Point; it is about 12 feet wide, 4 feet high, and the water around it dries, the outer end being awash at low water; there are rough steps at the end and on both sides. Rocky patch off the pier.

Jezirat Tanb (Tunb), 15 miles southward of Ras Dastakan and 8 miles from the Flat, is 2¼ miles in extent, 165 feet high, of brown color, and lever outline. There is a little peaked hummock near the

northeastern point, which shows well on northeasterly or southeasterly bearings.

The east coast is low rocky cliff, except at its northern and southern ends, where there is sandy beach. The beach extends about 1 mile northward from the southeast point, in a bay, where there are depths of from 3 to 4 fathoms about 400 yards offshore; the water deepens to 9 fathoms about 1 mile offshore, and then the depth increases rapidly to over 25 fathoms. The southeast point is a sandy pit, almost steep-to, with depths of 2½ fathoms 40 yards distant.

There are a few permanent inhabitants, who live in a village of some five well-built houses, with cultivated gardens and wells, a little way inland from the south coast, and there are some huts near the beach used occasionally by fishermen. The island is covered with coarse grass and shrubs, and there are a considerable number of goats and some cattle; fine oysters can be obtained.

The island belongs to the Principality of Sharjah; there is a representative of the Shaikh at the village, and the Shaikh's flag is hoisted at a flagstaff near the landing place there on a vessel's approach.

Light.—A flashing white light, 229 feet above high water, visible 21 miles, is exhibited from a white iron pile tower, 71 feet high, on the summit of Jezirat Tanb (lat. 26° 16′, long. 55° 19′.

Shoals.—The soundings around Jezirat Tanb are irregular. In 1889, a steamer reported having struck a rock or shoal on the northern side of the island, which should therefore be approached with caution.

A heavy tide rip has been seen 2½ miles northward of the lighthouse, and may be due to shoaler water than charted.

Foul ground extends a short distance off the southwestern part of the island.

Clive Rock, on which the E. I. C. S. *Clive* struck in 1835, is situated with the southwestern point of the island, bearing 112° 800 yards; it is detached and dries 4 feet. There are about 5 fathoms close around.

Do not decrease the water to less than 15 fathoms when rounding the southwestern point of the island.

Anchorage.—The best anchorage for a steamer is in about 7½ to 10 fathoms water on the east coast of the island. There is also anchorage on the southern side of the island in 6 or 7 fathoms, off a banyan tree, but the tidal currents here run strongly east and west. The currents are not so strong at the anchorage on the east coast, which is sheltered from the shamal, but open to the nashi.

A rocky flat with overfalls extends 5 miles southward from Jezirat Tanb; on its southern part, 5 miles, 156°, from the lighthouse, is a

7-fathom patch with from 10 to 17 fathoms around. Southward of the flat, the water deepens rapidly to 40 fathoms, and 3½ miles from the patch there are 82 fathoms, the deepest water in the gulf.

Landing.—The best landing is on the beach in the bay northward of the southeast point, except during a nashi; there is also a landing place at the village.

Tides and tidal currents.—At Jezirat Tanb springs rise 8 feet. The current has been observed to set westward from 3 to 1½ hours before until 3 to 4½ hours after high water, and eastward from 3 to 4½ hours after high water until 3 to 1½ hours before the next high water, at a velocity of from 2 to 3 knots; the currents are much influenced by the prevailing winds.

Coote Rock (lat. 26° 17′, long. 55° 25′), 6 miles, 80°, from Jezirat Tanb lighthouse, is a patch, about 400 yards in extent, with 4½ fathoms water, and depths of less than 10 fathoms, rock bottom, about ½ mile around, whence the water deepens to from 25 to 40 fathoms.

The tidal currents, which attain a rate of from 2 to 3 knots at springs, cause strong ripples over the rock.

Jezirat Nabiyu Tanb (Tunb), 7 miles, 260°, from Jezirat Tanb, is triangular in shape, 1 mile long northwest and southeast, and ¾ mile broad at the southeastern end. There is a dark hill on its northwestern point, with two little peaks 116 feet high. It is barren, uninhabited, and without water.

The island is steep-to, except on its northeastern side, where a reef extends 400 yards, and there are from 30 to 50 fathoms within 1 mile.

Jezirat Abu Musa (Bu Musa), 25 miles, about 212°, from Jezirat Tanb, is triangular in shape, each side being about 2½ miles long; it is mostly low, with numerous hillocks, some of which, being iron oxide, are dark chocolate in color. A small chain of hills in the western part of the island attains a height of 234 feet. Jabal Halwa, in the northern part of the island, rises abruptly to the height of 362 feet, is of a light pinkish color, and is conspicuous.

Two rocks, on which the sea breaks in moderate weather, lie 600 yards off the northern part of the east coast. Near the southern end of the east coast there is good anchorage, sheltered from the shamal, in 7 fathoms, sand.

The southeast point ends in a sand spit, steep to on its eastern side, but foul to the southward. The flag of the Shaikh of Sharjah (white with a red center) is sometimes hoisted at a flagstaff on the beach.

The south coast of the island is divided into three parts by two rocky points, with sand between. Both the eastern parts are foul, with rocks, which dry, and it is unadvisable to approach this locality

within 1½ miles. The western of the two points terminates in a conspicuous black rock, and there is a small village near where the Shaikh's flag is flown. A rocky shoal, with 2¾ fathoms water, lies ½ mile westward of this point; it is steep-to, and there is good anchorage northward of it in 6 fathoms, sand, sheltered from the kaus.

The western point of the island is the end of a range of hills, with a steep coast, and four off-lying islets, the largest of which is connected to the coast at low water.

The northwest coast is rocky, with two islets, and a shoal between them, lying off the entrance to a sandy bay; it is unadvisable to approach this coast within a mile, the 5-fathom curve being some distance off it.

The northern point (lat. 25° 54′, long. 55° 3′) of the island rises to a conspicuous hill, 153 feet high, with two summits, and bright red in color.

There is a small date grove in the northeastern part of the island, near which is a large house, the residence of the Shaikh, who visits the island in the summer.

There is a large quantity of iron oxide on the island; it is shipped in dhows to Abu Shahr and other gulf ports, and thence to England. Steam vessels have occasionally called at the island to load with oxide.

Supplies are not obtainable. A few goats and other domestic animals are kept by the natives, and water is obtained from wells.

Soundings.—Between the Jezair Abu Musa and Nabiyu Tanb there are from 30 to 58 fathoms; 6 miles northward of Abu Musa is a small 15-fathom bank.

Jezirat Abu Musa is 32 miles west-northwestward from Umm al Kaiwain, the nearest part of the Arab coast, and the soundings towards it from the mainland, in that direction, are from 8 to 20 fathoms over the Great Pearl Bank until within 11 miles of the island, when the water deepens to from 25 to 35 fathoms, but 6 miles south-southeastward of the island is a depth of 16 fathoms.

Tides.—It is high water, full and change, at Jezirat Abu Musa at 0h. 9m.; springs rise 7 feet. The tidal current sets southwestward from 3 hours before until 3 hours after high water, and northeastward from 3 hours after high water until 3 hours before the next high water, at a velocity of about 1 knot at springs.

This tidal information is approximate only.

The mainland—Mountains.—From the rounded mountain, 2,940 feet high, 10 miles northward of Basidu, a mountainous range trends westward, and at the distance of 14 miles is Grubb's notch, a saddle, 2,950 feet high, on the ridge. The range continues westward, and 12 miles farther is Linga Peak, 3,900 feet high, and conspicuous; between the peak and Jabal Bistana, 9 miles west-north-

westward of Ras Kharyu, the land rises gently from the coast to a height of about 300 feet, ending northward in cliffs, between which and the mountains is an extensive low plain, swampy after rain.

The coast from the low point northwestward of Basidu trends southwestward 25 miles to Ras Kharyu. The land near the point is low, but it rises to a mountain (lat. 26° 44′, long. 55° 8′), 1,330 feet high, 5½ miles to the westward, the western side of which falls to a plain; the outline of the mountain is very irregular, and the eastern part is of a light color, the western dark and apparently volcanic.

On the southwestern side of the plain just mentioned, which is about 4 miles wide, the land again becomes hilly; these hills extend 7 miles westward from the coast with a breadth of about 4 miles, and there is an extensive plain, very low and swampy, between them and Grubb's notch mountains. The northeastern part of the hills is a long light-colored ridge, 960 feet high, with a very jagged outline, rather remarkable on west-northwesterly bearings; the remainder are dark and volcanic, and a flat-topped hill, 620 feet high, near the shore, 4½ miles northeastward of Kung, is conspicuous from the eastward. Al Buza, ¾ mile eastward of the last-mentioned hill, is a similar but smaller hill.

Kale (Kaleh) Lashtan, 4½ miles west-northwestward of Kung, is a hill, about 600 feet high, with a sloping top and precipitous sides; on the summit is a ruined fort, which is not visible from seaward. The hill, which is detached from and shows over the land between it and the sea, is conspicuous on westerly and west-northwesterly bearings, when it appears quoin-shaped.

A hill, 400 feet high, lies 4½ miles west-northwestward of Linga; its top is quoin-shaped and conspicuous from the eastward.

Soundings.—Shoal water appears to extend about ¾ to 1¾ miles off the coast from the low point northwestward of Basidu to Ras Kharyu, but it has been only partially examined. Outside the shoal water is a gut or khur, from ½ to 1 mile wide, with from about 6 to 13 fathoms water, running generally parallel with the coast, southwestward to Linga, a distance of about 20 miles. Between the khur and North bank there are depths of from 3¼ to 4½ fathoms.

Caution.—When standing toward the coast, it is extremely dangerous to shoal the water on the inshore side of the khur.

Ras ash Shawari, 11 miles southwestward of the low point northwestward of Basidu, is low, sandy, and approached closely by the deep water of the khur. Bandar Hamairan is a bay northeastward of the ras, and about 3 miles from the ras is a shoal bank, 1¼ miles off-shore, with 4 fathoms water inside it, the deep khur being just outside. Native vessels anchor inside the bank, and bagales are laid up here.

Bandar Muallim (Mu'allim) village is situated in a date grove about 1 mile northward of the ras.

The coast from Ras ash Shawari trends west-southwestward 2 miles to Al Buza, and then turns southwestward, with an inshore bend, 5 miles to Kung; there are two date groves on it.

Kung (lat. 26° 35′, long. 54° 57′) is a fishing village extending ½ mile along the sandy shore, and is chiefly mat huts, with a population from 2,000 to 3,000, who own many boats. Much pottery is a common description is made here. At the southwestern end of the village is a large white ruined factory, and on the beach off it, where it covers at high water, is a round fort. There is a large date grove and much cultivation behind the village; a few supplies might be obtained. The landing is bad at low water, as the sandy beach dries off about ¼ mile in ridges, with 1 or 2 feet water in the spaces between. There is a date plantation on the coast about 2 miles southwestward of the village.

Anchorage.—There is anchorage in 5 fathoms, mud, 1¼ miles off Kung, from which shoal water extends 1 mile to the depth of 2½ fathoms, whence it deepens quickly to 4½ fathoms; the anchorage is sheltered except from the suhaili. Just outside the anchorage is the khur already mentioned, in which here there are 8 fathoms water. The 5-fathom curve trends northeastward and eastward from 3¼ miles southward of Kung, and the depth gradually decreases eastward to 3 fathoms on the western side of the flat. At 8 miles southward of Kung the water deepens to 10 fathoms.

Linga (Lingeh), 3½ miles southwestward of Kung, is a flourishing town, with many well-built houses, extending in a narrow strip 1 mile along the coast, with a cluster of houses a little way inland; its population is estimated at 8,000 during the summer, and 12,000 in the winter after the return of the pearling fleet. It has a pleasing appearance from seaward, with date trees behind it, and shows up well in the forenoon. The deputy governor's house in the front of the town is conspicuous, and the flag is flown from a tall white flagstaff near it; his guard consists of about 40 irregular troops, and he is entitled to a salute of five guns. There are two old muzzle-loading guns near the governor's house for saluting purposes. The tall minaret at the southwestern end of the town is very noticeable; its upper part, built of gray and green bricks, with the roof painted dark green, shows well against the light-colored land behind.

The town is partially defended on the land side by an insignificant wall with towers, outside of which are many circular doomed reservoirs, which are filled by the rain in winter. The customhouse is in front of the town, and on either side of it there are two basins, which dry, wherein small craft shelter. Bagalas and smaller native

craft are built here. Upward of 100 bagalas belong to Linga; some of them trade to India, etc., and about 40 boats go to the pearl fishery.

The population consists of Arabs, Persians, and Swahili negroes of the Sunni and Shiah sects. Persian and Arabic are both generally known at Lingua; either, or English, can be used in commercial correspondence.

Linga, and the district immediately around, are under the jurisdiction of a deputy of the governor general of the Persian Gulf ports, and a small detachment of Persian troops is stationed here.

The British vice-consulate is situated about 300 yards northwestward of the governor's flagstaff.

There are about 70 British subjects, including the troops forming the consular guard; the vice consul, the port medical officer (an Englishman), and a Belgian (custom's official) are the only whites.

Anchorage.—The best anchorage is abreast of the governor's flagstaff, which also is the most convenient position for boat work between the ship and the shore.

There is anchorage ¾ mile offshore, in 5 fathoms, clay bottom, and good holding ground, and for small craft, 600 yards further in, in about 4 fathoms; it is sheltered except from the suhaili, which sends in a heavy sea, but this wind is always of short duration. Close outside the anchorage there are depths of 7 and 8 fathoms in the khur, and it again shoals to 5½ fathoms 1½ miles offshore.

Tides and tidal currents.—It is high water, full and change, at Linga, at 0 h. 0 m. The tidal rise is 7½ feet at ordinary springs. Off Linga the current sets to the southwestward from two hours to six hours after high water, and to the northeastward from five hours before to one hour after high water at Maskat, at a rate of ¼ to ¾ knot.

Landing.—The best landing place is the basin northeastward of the customhouse.

Supplies.—Beef of poor quality, mutton, and vegetables can be obtained. Fowls, eggs, and fish are plentiful and usually cheap. Duck, bustard, and grouse can be shot during the winter months, but it is necessary to travel some miles inland to get them.

Recreations.—There is a tennis court near the governor's flagstaff, placed at the disposal of officers by the port medical officer and vice consul; there is a ground suitable for football near by the tennis court. For two rupees one can hire a boat with three or four divers for about five hours, with a 20 per cent interest in any pearls that may be recovered.

Radio.—There is a radio station at Lingeh. It is open to the public, and the office hours are from 9.45 a. m. to 7.45 p. m., Greenwich mean time. The call letters are V T L. There are two masts, each 156 feet high.

Communications.—The subsidiary steamers of the British India Co. call once a fortnight.

The customs launch from Bandar Abbas calls at irregular intervals, and a dhow conveys mails to and from Henjam weekly.

Repairs.—Linga is probably the best place in the gulf to get any ironwork made, or repairs executed, but the work is very roughly done. It is also the best place for boat building.

Trade.—Linga is chiefly noted for its pearl trade. The principal imports are cotton goods and twist, dates, fruits, grain, metals, oil, pearls, sugar, and tobacco, and the exports cattle, cotton piece goods, drugs, grain and pulse, oil, pearls, fish (fresh and salted), ghi, specie, and tobacco.

The facilities for landing and shipping cargo are good.

Currency.—The Persian shahis, kran, and tuman; Indian rupees and currency notes of all values are plentiful, and sovereigns are freely circulated.

Copper money is seldom seen at Linga, the 1 and 2 shahi nickel pieces being preferred.

Weights and measures.—The weights and measures are generally similar to those at Bandar Abbas, but the Linga man=900 miskals (94 pounds), and the Linga gaz=18½ inches.

Communications.—The vessels of the British India Steam Navigation Co.'s subsidiary mail service between Bombay and Basra, call at Linga weekly on their passage from Bombay, and fortnightly on their passage to Bombay.

Vessels of the Bombay-Persia, Arab Steamers, Anglo-Algerian, Bucknall Steamship call occasionally.

There is an Indian post office, but no communication by telegraph.

Pilots for the Shatt al Arab can sometimes be obtained at Linga, and they expect to be landed there on the return voyage.

Jisha (Jisheh) (lat. 26° 32′, long. 54° 52′), about 2 miles southwestward of Linga, and 1 mile northeastward of Ras Kharyu, is a small village in which there are two towers; there are date trees in its vicinity. The people are of Al Jowasim tribe, and are fishermen and agriculturists; there may be from 100 to 200 men. Water is obtainable.

Shoal water extends about ¾ mile off Jisha.

Ras Kharyu is low and sandy, with a rocky beach; a spit with 1½ fathoms water extends 900 yards southeastward round the ras, and a rocky 2½-fathom patch lies about ¾ mile southward of it. There is a depth of 14 fathoms close southeastward of the spit; the water then shoals to 7 fathoms, and again deepens to 10 fathoms about 3 miles southward from the ras.

The coast from Ras Kharyu trends westward and southwestward 3½ miles to Ras ash Shinas. Shinas Bay, between these points, is bordered by shoal water of less than 3 fathoms for about ½ mile; it affords good anchorage in from 5 to 7 fathoms water, sheltered from the shamal. In a nashi, the sea is not great, as it is broken by the Flat and Kishum Island.

Shinas (Shanas), on the western side of the bay and ¾ mile inland, is a small village, obscured from seaward by a thick grove of date trees; the population, from 200 to 300 men of Al Jowasim tribe, are both agricultural and fishermen. A white ruined tomb nearly 2 miles northward of the ras is visible from seaward, but it is not noticeable, except when the sun shines on it; at the eastern end of the date grove in front of the village is a large banyan tree, which is very conspicuous, showing dark against the date palms.

Ras ash Shinas (lat. 26° 30′, long. 54° 48′) is very low and sandy, with shoal water about ¼ mile off it, outside which the depth increases to 13 fathoms; there is a depth of 10 fathoms 1 mile, and 20 fathoms 5 miles, to the southward of the ras.

Tidal currents.—The tidal currents off Ras Kharyu and Ras ash Shinas attain a rate of 1½ knots, and cause a discoloration of the water.

The coast from Ras ash Shinas trends westward 9 miles, with a slight bend northward, to Ras Bistana; it is low and sandy, with rocky beach, the ground rising in a gentle slope to the foot of Jabal Bistana, except some white sand hills, about 30 feet high, close to the sea 1 mile westward of Ras ash Shinas.

There is a grove of date trees, with four wells, near the shore 2½ miles westward of Ras ash Shinas, and here the sand beach affords good landing. A domed white reservoir, 1 mile farther westward, and ¼ mile inland, is a good mark.

Anchorage off this coast, from which shoal water of less than 3 fathoms, extend about ¾ mile in places, is not sheltered in a shamal, but is well sheltered in a nashi.

Bistana Village (Bustáneh) (lat. 26° 31′, long. 54° 40′), 2 miles eastward of Ras Bistana, is small; there is a round tower in it, and a domed reservoir on the rising ground behind. There is a date grove at the village, and another between it and the ras. The population are chiefly fishermen of the Baní Marazik Tribe.

Boats anchor in 4 fathoms close to the shore nearly 1 mile westward of the village, and are partly sheltered from shamals, which here blow from the westward; larger vessels can not get close enough in to obtain much shelter.

Jabal Bistana is a remarkable isolated group of dark volcanic hills of very irregular outline, about 3½ miles in extent; the highest

part near the middle is a ridge, near the southern end of which, and situated 4¾ miles northeastward of Ras Bistana, is a little peak, 1,750 feet high, resembling a tower, conspicuous, especially from the eastward or westward. The southwestern part of the group, 3 miles from Ras Bistana, has been mistaken for the ras, when the lowland has not been visible. The land rises gradually to the foot of the hills, which are from 200 to 300 feet high.

Ras Bistana is low and brown in color. There are three little date trees 600 yards westward of the ras. Shoal water of less than 3 fathoms extends ½ mile off the southwestern side of the ras.

Shoal.—A shoal patch, with 3¾ fathoms water, and from 6 to 22 fathoms around, lies 1¾ miles southwestward of Ras Bistana.

Soundings.—There are depths of 12 fathoms about 1 mile, and of 20 fathoms about 5 miles, southward of Ras Bistana.

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CHAPTER X.

PERSIAN GULF, NORTHEASTERN SHORE.

RAS BISTANA TO, AND INCLUDING, ABU SHAHR (BUSHIRE).

Lat. 26° 30′, long. 54° 38′, to lat. 29° 05′, long. 50° 40′.

The coast of Persia from Ras Bistana to Abu Shahr (Bushire) is bold, with ranges of mountains along its whole extent, rising in places from close to the sea; there are many towns and villages on it, where small supplies of cattle and poultry can be obtained. The maritime population of the towns is Arab; the agricultural, either Persian or a mixed race of the two. The country, with the islands adjacent, belongs to the Persian Government, who receive tribute from the chiefs of the principal towns, to whom the government of their own districts is left.

Jezirat Sirri (lat. 25° 55′, long. 54° 32′), 34 miles, 187° from Ras Bistana, is somewhat triangular in shape, 3 miles long east and west, and 2¼ miles broad at its eastern end; it is low, with many small isolated dark hills, none of which exceed 50 feet in height. There are several rocks above water on its northwest coast, and one is ½ mile off the northwestern point; the east coast and southeastern low sandy point are steep-to, but elsewhere foul ground extends ½ mile from the island.

There are depths of from 30 to 44 fathoms about 1 mile around the island, and the lead is no guide in approaching it.

Sirri village, on the south coast, about 1¼ miles from the southeastern point, has about 60 houses and a population of about 600, mostly engaged in the pearl fishery, to which they send about 40 boats. A flagstaff stands near the village, where there are also several large and conspicuous trees. On the northern part of the island are several houses and small date groves. Cattle and goats are sent over from the mainland to graze here. A little fruit and vegetables might be procured, and perhaps a few cattle. Water can be obtained from wells near Sirri Village, but the landing is bad.

The ownership of the island is disputed between the Persian Government and the Shaikh of Sharja.

Anchorage off the island is very indifferent; the best is about ½ mile off-shore between the wells near Sirri Village and the southeastern point, in about 8 fathoms, rocky bottom; here there is

partial shelter from the shamal and nashi, but the holding ground is bad.

Soundings.—There are depths of 45 and 50 fathoms between Jezirat Sirri and the vicinity of Jezirat Nabiyu Farur.

Jezirat Nabiyu Farur, 12 miles north-northwestward of Sirri, is about ½ mile in extent, with a remarkable dark-colored saddle-hill, 120 feet high, on its eastern side.

A rocky reef, partly above water, extends ½ mile northwestward from the island; some authorities state that this reef extends 1 mile and that the sea has been seen breaking heavily on it at that distance. A narrow reef borders the west and south coasts. A bank with 8 fathoms, hard bottom, lies 1¼ miles south-southwestward from the islet; it has not been examined and there may be less water. There is a depth of 10 fathoms with the saddle hill bearing 270°, distant 1,200 yards. With these exceptions the water is deep around the island and the lead is no guide in approaching it.

Soundings.—There are depths of from 43 to 52 fathoms between Jezair Nabiyu Farur and Farur.

Jezirat Farur, 8¼ miles north-northeastward of Jezirat Nabiyu Farur, is 4 miles long north and south, 2½ miles broad, and rises in dark volcanic hills to a table-topped conical peak 465 feet high. The east coast is fringed by a rocky reef 400 yards wide and steep-to. A rocky flat, with some detached rocks above water, extends 200 yards from the west coast; there are 6 fathoms water close off it. Elsewhere the coast is steep-to with 40 fathoms water 600 yards from the cliffs.

Anchorage has been obtained in 20 fathoms water with a village on the eastern side of the island, bearing about 257°. There are about 50 people; cattle are brought from Mughu to graze, and firewood is obtainable. In a ravine on the eastern side are a few date trees, with some wells containing a little water.

From its height, dark color, and the deep water near it, the island is sometimes made at night, in thick weather, or during the haze of a summer shamal; caution, however, is necessary, as the tidal currents set strongly past it, and the lead is no guide when approaching it.

Farur Shoal (lat. 26° 26′, long. 54° 33′), the shoalest part of which, 2½ fathoms, at its eastern end, lies 7 miles, 16° from Jezirat Farur, and 5½ miles, 226° from Ras Bistana, is a patch of rock and sand; the shoal, with less than 5 fathoms water, extends westward about 3 miles. There are depths of from 11 to 16 fathoms around the shoal, but the 20-fathom curve passes close southward of it. The tidal currents set strongly over the shoal and cause ripplings, with much discoloration of the water. It is frequented by fishermen.

Soundings.—There are depths of from 25 to 44 fathoms between Jezirat Farur and Farur Shoal, but a British naval vessel obtained soundings of from 8 to 11 fathoms, sand, on a bank about 1½ miles in extent, situated with the north point of Jezirat Farur bearing 237°, 6 miles.

The passage between Farur Shoal and the 3¾-fathom patch off Ras Bistana, is 3 miles wide, with from 11 to 22 fathoms water, rock bottom, and overfalls.

Directions.—The passages on either side of the islands just mentioned are navigable, and by day, unless very hazy, there is no difficulty. From the eastward or westward, the passage southward of Farur Shoal is preferable. The 25-fathom curve, except over the 8-fathom bank, passes southward of Farur shoal; and Jezirat Farur generally shows well at night.

Tidal currents.—The tidal currents are strong off Ras Bistana, and are felt along the coast to the westward; the currents set westward from 3 hours before until 3 hours after high water, and eastward from 3 hours after high water until 3 hours before the next high water; but, apparently, little dependence can be placed on the times of their turning. The currents attain a rate of from 1 to 2 knots between the islands to the southward of the ras.

Mughu Bay.—The shore of Mughu (Mughu) Bay from Ras Bistana trends north-northwestward 7 miles, and then turns westward 7 miles to Ras Yarid; it is low and sandy, with a rocky beach near Ras Bistana, and the land rises gradually to the bases of Jabal Bistana and Jabal Yarid, between which and about 2½ miles inland is precipitous broken ground. The shores appear to be fringed with shoal water, extending off from about ½ mile to 1 mile.

There is good shelter from kaus on the eastern shore of the bay. but it is a dangerous anchorage in a shamal. For shelter, even from easterly winds, anchor near Mughu, or farther out, with Ras Bistana bearing about 103°, so as to be able to get to sea should a shamal set in. The bay is open to the suhaili. The depth is less than 10 fathoms, and the bottom is generally mud, good holding ground.

Shoal.—A patch, with 2¼ fathoms, or possibly less, water, lies 3¾ miles, 234°, from Mughu Village.

Duan Village (lat. 26° 35′, long. 54° 34′), on the shore 6 miles north-northwestward of Ras Bistana, is small; it has a small fort with two white towers, and a date grove behind and on each side of it. Good water is obtainable here, but scarecly anything else. It is a poor place, with perhaps 100 men, who send a few boats to the pearl fishery. There is a depth of 5 fathoms about ½ mile offshore here.

Mughu Village lies 3 miles westward of Duan and about 1 mile eastward of the foot of Jabal Yarid; there are several round towers

in the village, a large fort immediately behind it, and a date grove behind and westward of it; eastward, for about 2 miles, are low sandhills. It contains about 500 men of the Bani Marazik tribe, and sends 20 boats to the pearl fishery. The Shaikh of Mughu has authority over Hasina village, in Charak Bay.

Anchorage.—There is anchorage close off the village, and there is a depth of 4 fathoms, clay, nearly 1 mile off-shore; the shamal blows here from the westward, so unless near the shore there is then very little shelter. When in 4 fathoms the Yarid flat breaks the sea, but some swells roll in, making a vessel uneasy. The depth decreases regularly to the anchorage, and native vessels there are usually a guide. In a suhaili there must be a heavy sea, but the holding ground is good.

Supplies.—Water can be obtained here, also cattle and a few vegetables.

Mountains.—Between Jabal Bistana and the range of which Linga Peak is one of the summits, is a plain extending westward to Charak. There are several dark mountains on its northern side; of these one, haycock-shaped, and about 1,500 feet high, about 12 miles northward of Duan, is conspicuous.

Ras Yarid (Yurd) is low and broad, the coast bending round gradually; the southwestern extremity lies 12½ miles west-northwestward of Ras Bistana. Jabal Yarid (lat. 26° 38′, long. 54° 26′), about 2½ miles northward of the ras, is a rugged group of dark-colored volcanic hills about 1,200 feet high, which commences to rise ½ mile inland, and has a jagged outline but no marked peak. From the westward the northern bluff is conspicuous.

A flat, with less than 3 fathoms water, extends 2 miles southward and westward from Ras Yarid, with 7 fathoms close-to and 12 fathoms within ½ mile. By day the flat is marked by discoloration of the water.

Charak Bay.—The shore of Charak Bay from Ras Yarid trends northwestward 10 miles to Charak town, and then westward 4 miles to Ras Tawana; the depths in the bay are less than 10 fathoms, and regular. Hasina (Hasineh), a fishing village, is about 4 miles northwestward of Ras Yarid; there is a conspicuous round tower at both its southeastern and northwestern ends, and a large fort on the shore westward of the village; the land rises gradually to the base of Jabal Yarid. Anchorage off it is open to shamals.

The shore from Hasina to Charak is low and sandy, and can be approached to 1 mile.

Charak (lat. 26° 44′, long. 54° 17′) is a town with several towers and a grove of date trees behind it, and on a hillock some 90 feet high, about 800 yards northward of the shore, is a small fort in ruins. Charak has a clean appearance, and the inhabitants are

usually friendly and civil, but were hostile in 1912 when a British naval vessel visited the place; the population was then estimated at about 2,000. There is said to be a good pass into the interior. The Shaikh pays tribute to the Persian Government, and has authority over Jazirat Kais; his house is near the middle of the town. Charak sends about 100 boats to the pearl fishery; some bagalas also belong to it. There is a Persian customhouse here.

The sandy beach in front of the town dries off 400 yards in ridges, making landing bad at low water.

A mile eastward of the shaikh's house is a creek, into which a large watercourse flows; boats are hauled up here. A small village stands on its western bank.

Jabal Hamar, 1¼ miles westward of the shaikh's house, is 370 feet high, and appears quoin-shaped from the southwestward; there is a conspicuous hive-shaped tank on its southern side.

There are two rocky points, about 2 and 3 miles, respectively, westward of Charak, with sandy bays between; the shore between these points and westward of Ras Tawana is bordered by foul ground to the distance of about 800 yards.

Anchorage.—There is good anchorage off Charak, sheltered from the prevailing winds, but open to the suhaili, in 4 fathoms, mud, with Ras Tawana bearing 267°, and the fort about 5°. Some swell is felt here in shamals, which blow from the westward, therefore anchor as close in as the draft permits. There is good shelter from easterly winds.

Supplies.—Cattle, sheep, goats, fish, fruit, and water can be obtained at Charak; also firewood in small quantities, but dear.

Tawana (Távuneh) is a small village on Ras Tawana; the ras is about 28 feet high, with a rocky spit extending 700 yards off it. There are a few date trees here, four towers, and a castle on a rocky hillock at the ras. The village has a population of about 100 men. Good water is obtainable.

Anchorage.—Small vessels anchor ½ mile offshore, with the tower on Ras Tawana bearing about 295°, about ¾ mile, sheltered from shamals by the spit.

The coast from Ras Tawana trends westward 13 miles to Jirza and is steep-to. The plain between the mountains and sea is less than 1 mile wide at Tawana, and its width decreases to the westward. There is a noticeable peak about 8 miles west-northwestward of Ras Tawana, and 2 miles inland. The inner mountain range extends, apparently with gaps in it, west-northwestward from the peak, 2,940 feet high, northward of Basidu.

Jabal Turanja (Turanjeh) (lat. 26° 57′, long. 54° 07′), 15 miles north-northwestward of Ras Tawana, is of a flattened dome shape,

and light in color, with a small hummock on the summit, 5,150 feet high; it is conspicuous seaward from Basidu until on an easterly bearing, but is obscured by a lower range when nearer than about 10 miles to the coast. The mountain is part of the range just mentioned, which continues some distance farther westward.

The coast range, from 2,000 to 3,000 feet in height, commences northward of Charak, and extends to about 15 miles west-northwestward of Chiru, leaving a great valley between it and the Turanja range.

Jezirat Kais, about 10 miles southward of the coast, 13 miles westward of Ras Tawana, is oval in shape, 8½ miles long east and west, 4½ miles broad, and of even convex outline, rising to a level tract about 120 feet high, which, being light brown in color, is difficult to see at night. The coast of the island are low and the beach sandy with rocky points; the eastern and western extremities are low cliffs. There are many trees on the island, and several villages on its northern side; it is under the Shaikh of Charak, and sends about 50 boats to the pearl fishery. Reefs, nowhere extending a mile off-shore, surround, the island, with deep water close off them, but shallower water than was supposed to exist has been reported on the south coast; until this has been examined, give that coast a berth of at least 1½ miles.

The northeast point is low and sandy. Mashi (Masheh) village, with about 500 men of Al Ali tribe, chiefly employed in the pearl fishery, extend about 1 mile along the coast southward of the point; in it are two square forts, a round tower, a well, and some date and banyan trees.

Lightship.—A lightship is moored about 9½ miles westward of Jezirat Kais; it is painted red, and marked "Kais Island" in white on each side, and carries a fore and jigger mast, with a central lantern tower, painted white, between them, from which a light is shown at an elevation of 32 feet.

Mashi Fort, on the point, has two towers, from the northern of which a flag is flown, and is conspicuous.

The east point, nearly 3 miles southeastward of the northeast point, is a cliff about 6 feet high, with a conspicuous tower on it, and thence the coast trends southward about ½ mile, whence it curves gradually westward to the west point; there are one or two small date clumps on the south coast of the island.

From the northeast point (lat. 26° 33′, long. 54° 02′), the coast trends westward 4 miles to the north point, which is cliffs about 15 feet high; Dih, 1¼ miles from the northeast point, is a small village, with date plantations and gardens, and halfway between it and the

north point are the ruins of the ancient Muhammadan town of Harira.

From the north point the coast trends southwestward 3½ miles to the west point, which is rocky and a few feet high. Safil, ¾ mile westward of the north point, is a small village with about 200 men, mainly fishermen and cultivators; landing is bad at low water owing to a reef which dries off about ¼ mile. The interior of the island is cultivated in parts and has many flocks and herds. Water can be obtained by digging wells almost anywhere near the coast, but it would probably be brackish after a long drought.

A sandy spit extends 1,300 yards north-northeastward from the northeast point, with less than 3 fathoms water for 600 yards from the point, 3½ fathoms on the outer part, and deep water close outside. In Mashi Bay there are 6 fathoms 600 yards eastward of the northeast point and of the northern part of the village, deepening regularly from the shore; foul ground extends 1,400 yards northward from the east point.

Foul ground extends about ½ mile off the south and west coasts of Kais with 6 and 8 fathoms closeto and thence deepening rapidly. On the north coast a reef with less than 3 fathoms water commences at the northeast point where it is about 600 yards wide, and widens to the westward; off Safil it is 1,400 yards wide, and between that place and the west point nearly 1 mile. There is a depth of 20 fathoms about 2 miles northward of Harira, and also about 3 miles northwestward of the island; from this depth toward the island it shoals quickly to 13 fathoms.

Anchorage.—The best anchorage is off the northern part of Mashi, eastward of the northeast point of the island. In summer, when easterly winds are not experienced and shelter is often required from shamals, anchor in from 8 to 9 fathoms mud, with Mashi Fort on the northeast point bearing between 283° and 294°. In winter anchor in the above position or about ½ mile northward of the northeast point in 10 fathoms mud, with Mashi Fort bearing about 180°, a position partly sheltered from shamals, which in this locality blow from the westward; here a sailing vessel could weight if an easterly gale came on.

There is anchorage 1¼ miles northward of Harira in 8 fathoms, open to the prevailing winds.

Tides and tidal currents.—It is high water, full and change, at Mashi, at 0 h. 30 m.; springs rise 7½ feet. The tidal currents are strong in the channel between the island and the mainland, but are weak in the deeper water to the southward.

Directions.—In the passage northward Jezirat Kais do not close the island to a distange less than 2 miles, unless for anchorage.

At night it is difficult to see the island, and caution is required in passing southward of it, there being a depth of 40 fathoms within 3 miles; on the northern side there is a greatest depth of 36 fathoms in about mid-channel. The passage northward of the island is not recommended at night unless the island is seen.

Supplies.—Cattle, vegetables, and water are procurable at Mashi. The natives keep large herds of cattle and flocks of goats.

The coast.—Jirza (Gurzeh) (lat. 26° 44′, long. 53° 58′), on the mainland, about 13½ miles westward of Ras Tawana, is a small village with a tower and date grove. It is situated on the north shore of a bay, where anchorage, sheltered from shamals, can be obtained close to the shore; on both sides of Jirza the coast is fairly steep-to, with 20 fathoms 1 mile from the beach.

Kalat al Abeid (Kalat), on the coast 4½ miles west-southwestward from Jirza, is a village and fort with a round tower 250 feet about the sea; there are a few date trees. The fort and tower are situated on a hill at the back of the village. There are a number of date grooves eastward of the village. There are two towers in the village, one round and the other square. Below the fort is a tomb on a hillock about 150 feet high; about 1 mile eastward of the village are several water reservoirs with dome-shaped roofs, where water can generally be obtained. The population of the village is about 150 men of the Bani Hamadi Tribe, mostly fishermen.

There is a depth of 5 fathoms 1,600 yards southward of the fort. A spit projects, apparently about ¼ mile, from the point about 1 mile westward of the village, and the sea breaks on it.

Landing is bad at the village and often impracticable.

There is anchorage, close to the shore, with the western extremity of the point bearing 260° in 4 fathoms water, sand bottom (but there may be less water here), sheltered from shamals, and partially from nashis. About ¾ mile offshore there is but little shelter.

The coast from Kalat al Abeid trends westward 7½ miles, and then curves southward 1½ miles to Chiru Point, and some 4 miles westward of Kalat al Abeid a small range of hills about 200 feet high rises steeply from the coast. A spit extends ½ mile offshore about 3 miles westward of Kalat al Abeid, and a flat with less than 3 fathoms water extends 700 yards off the shore eastward of Chiru Village.

Chiru, about 1,800 yards north-northeastward of Chiru Point, is a village with a large date grove. It has a population of about 200 men of the Obaidli tribe, chiefly fishermen. The Shaikh of Chiru has authority over Jezirat Hindarabi. A few cattle and a small quantity of water might be obtained here.

Anchorage.—There is good anchorage off Chiru in about 8 fathoms of water; it is easy of access in shamals, but open to easterly winds.

Chiru Point (lat. 26° 42′, long. 53° 45′) is a low projection; there is deep water southward of it.

The coast from Chiru Point trends northwestward 14½ miles to Ras Nakhilu; it rises steeply to hills, which decrease in height toward, and terminate near, the ras. A table-topped hummock, 2,536 feet high approximately, 7½ miles north-northwestward from Chiru Point and 4 miles inland, is rather remarkable from the southward. All the mountains in this locality are light in color.

Flat.—A sand flat, with 2 fathoms water, extends about 1 mile off the coast for about 3 miles northwestward of Chiru Point, and there is a depth of 16 fathoms close outside it. By day it is marked by discolored water, but the passage between it and Jezirat Hindarabi Reef, being only 1 mile wide, requires caution in its navigation. The tidal currents are strong, and, with opposing wind, there is broken water along the edge of the flat.

Bandar Mansuri is an anchorage, on the flat 2 to 3 miles westward of Chiru Point, used by native vessels; it affords indifferent shelter to such craft from easterly winds.

Tides and tidal currents.—The time of high water, full and change, on this coast is very imperfectly known, but it is probably between 1 h. 0 m. and 3 h. 0 m. The currents are strong in the passages between the islands and the mainland, but weak in the deep water outside.

Sambarun, 7½ miles 175° from Chiru Point, is a rocky bank about 1 mile in extent, with 6 fathoms water and from 17 to 33 fathoms close around.

Jezirat Hindarabi, about 3 miles west-southwestward of Chiru Point, is 4 miles long east and west, 2 miles broad, and rises gradually to a height of about 100 feet; it is brown in color, and difficult to see at night. A large banyan tree stands on the southeastern point of the island; the east and west points are low cliffs, and about 50 yards off the west point is a flat detached rock, some 10 feet high. There is a walled village near the middle of the north coast, with a few trees, some cultivation, and some wells, but the water is brackish in summer. The inhabitants, Obaidli Arabs, about 150 men, are fishermen and cultivators, and possess some flocks.

The island is fringed by a reef ¼ mile broad on the north coast, and the landing at the village is bad at low water; off the northeast and east coasts the reef is a little broader and steep-to; on the south coast it probably extends 1 mile and is steep-to, with 30 fathoms close outside. Some detached patches extend about ½ mile off the west point,

and a flat, with from 5 to 9 fathoms water and 20 fathoms close to, 2 to 3 miles farther westward.

Anchorage.—There is anchorage off the village in from 6 to 8 fathoms, rocky bottom, but open to shamals; there is said to be not much sea here during easterly winds; a fresh breeze opposing the stream would render a vessel uneasy.

Caution.—A current is said sometimes to set toward Hindarabi and the coast in its vicinity; this should be guarded against at night.

Villages.—Machahi (Makahil), a small village on the coast, 12 miles northwestward of Chiru Point, and Jazza (Jazeh) (Gazeh), a village nearly 1 mile farther northwestward, are under the Shaikh of Kalat al Abeid; both have towers and a few trees near them. The inhabitants are fishermen. Anchorage off the village is open, and there is a depth of 20 fathoms 1½ miles offshore, and deep water close in.

Ras Nakhilu, 1½ miles northwestward of Jazza, is low and ill defined, with high sand hills just northward of it; here the coast turns northward. A bank extends about 1,600 yards from the ras; a depth of 3 fathoms water has been obtained on the bank, which is probably steep-to.

Jezirat Sheikh Shuaib (Shaikh Shu'aib), the eastern end of which is about 6 miles west-southwestward of Ras Nakhilu (lat. 26° 50′, long. 53° 30′), is 13 miles long east and west, with a general breadth of about 2½ miles. It is brown in color, and rises gradually to a height of 120 feet in the middle, the eastern and western parts being low plains 1 to 2 miles from the extremities. A single large round conspicuous tree stands on the summit, 5½ miles from the western end; there is also a tree 2½ miles southeastward of the west point.

The east point of the island is low sand. The southeast point of the island is a cliff about 20 feet high, and from it the coast trends westward 4¾ miles to a sandy point. Korat (Kurat), a village with about 100 men, on this point, has a tower and large grove of date and other trees. Westward of Korat the coast, nearly all rocky cliff, turns gradually northwestward to the west point, which is also rocky, and from 6 to 10 feet high.

From the west point the north coast trends eastward 2 miles, where a small bight affords good landing for boats, and then eastward and southeastward to the east point; it is cliff, with one or two little sandy bights. Ras, a village with a round tower and a few trees, is situated 1 mile eastward of the west point. Daku (Dekhun) Village is about 8½ miles eastward of the west point, and Laza Village, 1 mile farther eastward, has a tower; there are some 30 or 40 men in each of these villages.

Laz, the principal village on the island, stands on a small rocky point on the north coast, nearly 1 mile from the eastern end; it has a high square tower and about 150 men. There are many large round trees and a few date palms southward of it. In the middle of the island is a valley containing four villages, each having from 30 to 50 men.

The inhabitants of the villages are chiefly fishermen, but some cultivation is carried on; the adult male population amounts to about 500, and they send 25 boats to the pearl fishery.

Shoals.—A narrow spit extends northeastward from the east point of the island, with 2 fathoms water at the distance of ½ mile, whence the depth increases gradually. The south coast is fringed by a reef about 200 yards wide, and there are depths of from 35 to 45 fathoms about 1 mile off it. A flat, with 4 fathoms water, extends about 1 mile from the west point of the island, about 3 miles west-northwestward from which the water deepens to 10 fathoms. The north coast is fringed by a reef from 200 to 400 yards wide, with from 9 to 13 fathoms at the distance of 1 mile.

Jezirat Shitwar (Shatvár) (lat. 26° 47′, long. 53° 25′), 1,400 yards east-southeastward from the east point of Jezirat Sheikh Shuaib, is 1 mile long east and west, ½ mile broad, and low; it appears to be bordered by reefs to the distance of 300 yards. The 20-fathom curve is 1½ miles eastward and 3 miles southward of the island; a 9-fathom bank, apparently hard sand, about 1 mile in extent, lies 3½ miles east-southeastward, and a 4-fathom bank 1,600 yards southeastward from it.

There is a depth of 2½ fathoms in the fairway of the channel between the Jezirat Sheikh Shuaib and Shitwar, and the best course through is said to be from about 600 yards off the southeast point of Jezirat Sheikh Shuaib to about ¼ mile northwestward of Jezirat Shitwar, but caution is necessary, as the channel has not been examined.

Anchorage.—In southeasterly winds shelter might be obtained northeastward of Laz Village (lat. 26° 48′, long. 53° 23′), ½ mile offshore, in from 4 to 7 fathoms, sand and rock, but it would be necessary to weigh on the approach of a shamal, which blows from the west-northwestward. Shelter can be obtained from shamals between Shitwar and Korat, in 8 fathoms, from 600 yards to ½ mile offshore, but this locality has been only partially examined.

There is good anchorage in Shitwar Channel in 3 fathoms, sand and rock, well sheltered from shamals, and to some extent from easterly winds. Enter the channel from the southward and anchor rather toward the western side, with Laz Tower in line with the low eastern point.

The channel between the islands and the mainland is about 4 miles wide at the eastern end, but the width increases to about 11 miles at the western end. The tidal currents are felt across the channel, and also strongly between the Jezirat Sheikh Shuaib and Shitwar, causing a ripple on the spit off the east point of Jezirat Sheikh Shuaib. The soundings between Jezirat Sheikh Shuaib and the mainland are generally from 17 to 20 fathoms, which depths reach about 2 miles from either shore.

Directions.—Jezirat Sheikh Shuaib is exceedingly difficult to see at night or in hazy weather, and the lead is of little use when approaching it from seaward. The coast in the vicinity of Ras Nakhilu should not be approached to less than 15 fathoms.

Tides and tidal currents.—It is said to be high water, full and change, at the eastern end of Jezirat Sheikh Shuaib, at about 3 h. 15 m.; springs rise 6 feet. The west-going tidal current has been observed to begin about 1½ hours before high water about 3 miles northwestward of the east point of Jezirat Sheikh Shuaib. The tidal currents are said to set north-northeastward through the channel between Jezirat Sheikh Shuaib and Shitwar from 5 hours before till one hour after high water, and south-southwestward from one hour after high water till 5 hours before the next high water. This tidal information must not be depended upon. The tidal currents are strong between the island and the mainland, but weak in the deep water to the southward.

Supplies.—Cattle, vegetables, and fruit in small quantities can be obtained at the principal villages, but any supply of water is uncertain.

Stiffe Bank, about 25 miles 180°, from the western point of Jezirat Sheikh Shuaib, is about 4 miles in extent north and south, and 2½ miles east and west, with depths of from 15 to 19 fathoms, and from 30 to 40 fathoms around. The bank is stated to be about 2 miles westward of the position above given.

Shah Allum Shoal (lat. 26° 26′, long. 52° 30′) is a rocky patch, about 600 yards in extent, in the fairway of the gulf, situated with the west point of Jezirat Sheikh Shuaib bearing 55° 43 miles, and Halul Island bearing 186° 45 miles. with 2½ fathoms least water. A bank, with less than 20 fathoms water, extends 2 miles southward from the shoal. The shoal and bank are steep-to, with depths of about 35 fathoms a mile distant. The water is not discolored and the shoal can not be seen from aloft; some white birds are generally hovering over it.

Cable Bank, 35 miles, 261°, from the western end of Jezirat Sheikh Shuaib, is about 3 miles in extent, with 14 fathoms or perhaps less water. It was passed over by the vessels laying the telegraph cable in 1885.

The coast from Ras Nakhilu trends northward about 8 miles and then west-northwestward 25 miles to a small bay at the foot of Shahin Kuh, whence it trends northwestward 28 miles to Ras Naband.

Mountains.—The range extending westward from Jabal Turanja, on the northern side of a valley, approaches the coast near Magam, and then, continuing along the coast, it ends at Ras Naband in low hills. A fall or dip in the summit, 7 miles north-northeastward of Ras Nakhilu, is remarkable. The summits of a range, from 4,000 to 5,000 feet high, running parallel to the coast about 12 miles inland, are visible over the coast range.

Nakhilu Village, 3 miles northward of Ras Nakhilu, has a large grove of date and other trees; its population is from 200 to 300 men of Al Jowasim tribe, and it is under the Shaikh of Charak. Anchorage off this village and along the coast to the northward is well sheltered in easterly winds, but open to shamals.

Magam (Mugam), 4½ miles northward of Nakhilu, is a large village with a large square fort. There is a conspicuous triangular cliff, about 165 feet high, 1.4 miles northwestward of the fort. Shoal water of less than 3 fathoms extends to 1,600 yards off the shore. There is anchorage in 6 fathoms, with the fort bearing 58° 1.4 miles.

Bandar Basatin (lat. 27° 00′, long. 53° 24′) is a little bay about 4½ miles west-northwestward of Magam Fort. The small western point of the bay, from which a spit extends ½ mile, is low and projects from rocky hills just westward of it; there are some water cisterns near the point. A low, jagged, light-colored ridge of rock in range with a peak, 4,870 feet high, 33°, leads to the point.

There is anchorage about ½ mile eastward of the point, but it affords little shelter from shamals, which here blow from the westward or west-northwestward. Small vessels might anchor with the point about 270°; larger vessels as close in as the draft permits. There is a depth of 10 fathoms about 1 mile from the shore.

The coast from Bandar Basatin trends west-northwestward 13 miles to Shiwu, and rises steeply to a ridge of precipitous hills from 200 to 300 feet high. There is a somewhat remarkable saddle hill, about 400 feet high, on the ridge, 2½ miles eastward of Shiwu.

Shiwu Village (Shívuh) has three large banyan trees; the population, judging from the number of huts, appears to be about 1,000 men. The village belongs to Shaikh Mazkur of Gaobandi. About ½ mile southeastward of the village is a peaked hill from 200 to 300 feet high. A large flat black rock projecting in front of the village forms a small boat harbor, and the best landing place. Westward of this is a shallow sandy bay, 1 mile wide, in which, 900 yards, 295°, from the flat rock, is a small rock above water, is nearly steep-to, and there is a depth of 5 fathoms close to it.

Anchorage.—The anchorage at Shiwu, in 5 fathoms, sand, about ¼ mile off the black rock, is said to be tolerably sheltered from shamals, but there would probably be considerable swell.

This anchorage was found by the British navel vessel *Philomel* in 1911 to be a good one when a shamal was blowing; although there was a swell, which rendered landing impossible, it was much less than at other open anchorages. The tidal currents are weak, and the vessel lay with her head to the wind. There is a depth of 15 fathoms 1 mile offshore, and the water shoals from 10 fathoms to 5 fathoms in the distance of 200 yards.

Supplies.—Cattle can be obtained here; also some good water from wells close to the beach.

Bandar Kallatu (Kalátu).—A rocky point, with hills rising steeply from it, lies 2 miles west-northwestward of Shiwu; Bandar Kallatu, westward of the point, is a bay affording good shelter to small native vessels in shamals. A vessel of moderate size can obtain better shelter here than at Shiwu, about ¼ mile from the point, and as far in the bay as the draft permits.

The coast from Bandar Kallatu, mostly cliff with little sandy bays, trends west-northwestward about 5 miles to Bustanu Village, with hills rising steeply from it. There are many boat anchorages, sheltered from shamals, close off the coast, which is steep-to, there being 25 fathoms at the distance of about 1 mile. There is a village on the coast about 1½ miles westward of Bandar Kallatu.

Bustanu Village is situated at the head of a small bay, which is probably one of the best of the anchorages; the anchorage bears about 161° from the summit of Shahin kuh. A ridge of gray-colored rock, about 100 feet high, runs down to the shore just eastward of the village, and has a tower on its southern end.

The village consists of about 50 houses on the side of a low sandy hill, and has five conspicuous trees. At the back of the village the hills rise to a height of about 100 feet, and there is a conspicuous square tower on them about 300 yards southward of the village. There is a small creek northward of the village, which will accommodate dhows.

Shahin kuh (Sháhin kúh) (lat. 27° 09′, long. 52° 58′), 8 miles west-northwestward of Shiwu and about 1 mile inland, is remarkable, flat-topped, and slopes slightly to the northward, with precipitous sides; its southern bluff is 1,100 feet high.

The coast from Bustanu Village trends northwestward 28 miles to Ras Naband; it is bold and rocky, with low cliffs, devoid of anchorages or shelter, and is steep-to at the distance of 200 yards.

Bandar Tibben lies in a small bay and has one square hut visible from seaward. About 1 mile northward of the village is a small bay, where dhows usually anchor.

The village is the only one known on this coast, lies about 12 miles northwestward of Shahin kuh; it is scarcely noticeable from seaward. Here a bight, some 6 miles in length, appears to extend about 2 miles to the eastward, but it not shown on the chart. A small creek, open to the southeastward, in which two dhows were seen at anchor, lies about 1½ miles northwestward of the village; it is not visible from seaward.

The coastal district between Shahin kuh and Ras Naband is named Asban.

Ras Naband (Nâband) is a broad projecting rocky cliff about 10 feet high, the land rising gradually from it to the southeastward. About ½ mile inland is a large date grove, and 3 miles southeastward is a single conspicuous tree on some high tableland.

Shoal water extends about ½ mile northward of Ras Naband, and 2½ miles northeastward from it, and 1½ miles northwestward from Naband Village, there is a depth of only 2½ fathoms.

The western side of the ras is steep-to, and the water deepens gradually to 30 fathoms 3 miles westward.

Pearls are fished for off Ras Naband, and it is the only place near the Persian coast where any have been found; none of much value have been obtained here.

Tidal currents.—The tidal currents are scarcely perceptible between Shiwu and Ras Naband, nor are they much felt to the northward until near Ras al Mutaf. The currents in Naband Bay are weak.

Naband Bay, on the northern side of Ras Naband (lat. 27° 23′, long. 52° 35′), is 3 miles wide in the entrance, and recedes 5 miles to its head. There is a depth of about 10 fathoms in the entrance, whence it gradually decreases and becomes shallow toward the head, there being but three fathoms, mud, 2 miles from the shore. The mountainous range lying northeastward of the valley behind the Asban coast continues northwestward within Naband Bay. On the range, 20 miles, 100°, from Ras Naband, is a bluff 3,600 feet high, which is conspicuous from the northwestward.

The shore of the bay from Ras Naband trends eastward 4½ miles; it then bends round northward and westward to the northern point of the bay, which is situated 4½ miles north-northeastward of the ras. The ruins of Kassad, a large village whence a date plantation lines the shore to the head of the bay, are about 1 mile eastward of the ras. The southern shore of the bay is low and rocky, the land behind rising to a moderate height; the shore at the head is low, sandy, and swampy in places. A great valley where a small river appears to have its mouth commences here. A few miles eastward of the head of the bay is a pass into the interior, said to be practicable for carts.

Naband, a village, with two round towers, one square fort at its western end, and several conspicuous trees on either side of the village, stands on the southern shore of the bay 2½ miles within the point; its population is about 250 men of Al Haram tribe. Wheat and barley are exported, principally to Bahrein. The shore reef extends about ½ mile off the village; the native boats pass over the reef and anchor close to the beach.

The following small villages lie between Naband and Nakhl Takki: Haleh, Basateen, Akhan, Bazbaz, Charaif, Baid Kahn, and Aslu.

Nakhl Hashim, 1½ miles eastward of Naband village, is a small village; a reef extends about ½ mile off the point projecting between these places, and here boats anchor close in, sheltered from shamals.

Bandar Baid Khan (Baidheh Khán).—On the northern shore of the bay, bearing 19° from Naband village, is a sandy point from which a reef extends 200 yards; small craft anchor eastward of the point, in shamals, in 2½ fathoms or less water, with very indifferent shelter; the shore for about 2 miles eastward of the point is low, swampy, and intersected by mangrove creeks. Water, not good, is obtained by digging in the sand on the point. The bandar is frequented by fishermen from Aslu, who use large seines, and haul their boast up on the point.

Baid Khan village is about 1 mile inland, and nearly hidden in a grove of date and other trees; a little stream of water is used for irrigation. The north point of the bay (lat. 27° 28′, long. 52° 37′), 1¼ miles west-northwestward from the western point of Bandar Baid Khan, is low, and a reef extends ¼ mile off it. Date groves begin close northwestward of the point and extend past Aslu Town.

Shoal.—A small rocky patch, with 3 fathoms water, lies about 1½ miles, 212°, from the north point of Naband Bay; it is steep-to, and does not show well.

Anchorages.—There is anchorage in 6 fathoms with Naband Village bearing from 135° to 180° distant 1 mile, but the holding ground is said to be bad. Naband Bay affords no shelter in shamals, except for boats.

There is anchorage in 3 fathoms, good holding ground, with a square house westward of Baid Khan Village bearing 19°, and a tower, 2½ miles southeastward of the village, 86°; it is said to be partially sheltered in shamals.

Directions.—Anchorage anywhere in Naband Bay is sheltered in kaus, but open to shamals, and a heavy sea then rolls into the bay. The passage between the 3-fathom shoal, 1½ miles off the north point of the bay, and the reef off the point is about 1 mile wide, but should not be used; the passage between the shoal and the reef off Naband

village is 2 miles wide and by far the better. The reef off Aslu should not be approached to less than 7 fathoms.

Supplies.—Fish, cattle, and vegetables can be obtained in Naband Bay.

The coast from the north point of Naband Bay trends northwestward 37 miles to Kangun, and a range of mountains extends along it, the seaward face of which appears to be precipitous; the fires of charcoal burners are sometimes seen at a height on the mountains.

Jabal Siri Yafal (Sir i Yalfal) (Aslu notch), 6 miles northward of the north point of Naband Bay, on the summit of the range, is 4,870 feet high, and shows as a great step, except from the westward, when it appears a sharp notch.

Jabal Siri Ayenat (Síri 'Ayánát) (Barn Hill), 26 miles northwestward of Jabal Siri Yafal and 5 miles inland, is a most conspicuous barn-shaped peak, 4,660 feet high, on a long level-toped part of the range, which terminates in the Fall, a great step, 17 miles further northwestward; the peak is small on easterly bearings. Siri Ayenat is obscured from near the coast by a lower coast range, which, commencing near Barak, continues increasing in height, northwestward past Kangun.

Aslu ('Asalu), 1 mile northwestward of the north point of Naband Bay, is an independent town with a population of about 1,000 men of Al Haram Tribe; it extends ½ mile along the coast, and there is a large date grove behind. The people possess many small boats, and take part in the pearl fishery.

A conspicuous round tower, now partially destroyed, stands on a small hillock about midway between Aslu and Nakhl Takki. Vessels should approach both these villages with caution, on account of the reef which here extends from the shore, as mentioned in the Pilot.

A reef extends over ½ mile off the coast for 3½ miles northwestward of the north point of Naband Bay, and there are depths of 5 and 6 fathoms close outside it. Boats pass over the reef and shelter close to Aslu town, in rather more water than there is on the reef. Anchorage off the town is open to shamals.

Supplies.—Cattle might be obtained here.

Nakhl Takki (Tagi), 2 miles northwestward of Aslue, is a small village, with a fort and tower; there are some date trees near, and two or three large round trees between it and Aslu. A reef extends about ¼ mile off-shore here, and there are depths of about 8 fathoms close outside it. The 20-fathom curve is about 1 mile off the coast from Nakhl Takki to Tahiri, 17 miles northwestward; the bottom is mud.

Barak (Banak), 13 miles northwestward of Nakhl Takki, is a small village, with a fort, a square tower, and a date grove. There

is a small village, with a square tower, 2½ miles southeastward of it. The coast between Nakhl Takki and Barak rises steeply to hills; it is nearly steep-to, with little or no reef.

Shoal.—Off Barak Village boats are partly sheltered in shamals by a low projecting point, on which are date groves, 2 miles westward of it; from this point, which is the southeastern point of Tahiri Bay, a shoal, with from 2 to 3½ fathoms water, extends about 1 mile south-southeastward, and is steep-to.

Tahiri (Táhiri) (lat. 27° 40′, long. 52° 20′), 2 miles northwestward of the point just mentioned, is a village, chiefly mud houses, on the shore of the small Tahiri Bay, and extends partly up the side of hills, about 700 feet high, rising from the head of the bay. A fort stands at the eastern end of the village, ½ mile eastward of which are three large round conspicuous trees. In the middle of the village are two white mosques about 300 yards apart, and on a small hill westward of the village are the ruins of a mosque. The population of the village is from 200 to 300 men, all fishermen.

The northwestern point of the bay, 1 mile westward of the village, is low and on it are date groves; it is almost steep-to. There are depths of about 8 fathoms ½ mile off the shore of the bay, whence it shoals gradually.

Anchorage.—There is anchorage close to the shore in about 6 fathoms, with the western point bearing about 284° partially sheltered in shamals, but there is little or no shelter from kaus. The holding ground is good.

Supplies.—A few cattle and some vegetables can be obtained; water is plentiful and good.

The coast between Tahiri and Kangun, 17½ miles northwestward, is fairly steep-to, and can be approached to about ½ mile.

Shilu (lat. 27° 41′, long. 52° 16′), 4 miles northwestward of Tahiri, is a small village with a tower, in ruins. Ras Akhtar, 2 miles west-northwestward of Shilu, slightly projects, and northwestward of it is a bight where boats can anchor, sheltered by Ras Aswat, which is farther northwestward, and small.

Ayenat ('Ayánát), about 9 miles northwestward of Tahiri, is a village, with a few trees interspersed among the houses; there is a small square tower and also date groves at either end, and a large square house at the western end. There is anchorage off it in 10 fathoms, which is said to be tolerably good in shamals; a small reef of rocks off the village forms a boat harbor. About 4 miles northwestward of Ayenat is Mayalu (Miyalu), a little village.

Tumbak, a village of about 100 houses, is situated about 1½ miles northwestward from Ayenat. There are two round conspicuous towers at the back of the village, each on top of a small round sand hill and about ½ mile apart. There is a conspicuous round tower at

the western end of the village, and several square towers among the houses. There are large date groves on both sides of the village and many trees in the village itself.

The water shoals gradually toward the village and the sea breaks against some rocks situated about ½ mile off-shore. Dhows anchor inside these rocks.

There is good anchorage in 5 fathoms ¾ mile from the village, and the landing is good.

Kangun (Kangún) is a town with a population of about 500. It has one square tower at the southern end of the village. A large date grove lies ½ mile northwestward from the village. The Chief is subject to the Persian Government, to whom he pays a yearly tribute; all the villages from Barak to Shiwu, not including Aslu town, are under his authority, as is also Banak, a small village about 3 miles northwestward of Kangun. At the town the beach is sandy, but from Ras al Marrar, which is 2 miles to the southeastward and low, rocks extend about 200 yards.

Anchorage.—There is anchorage in 5 fathoms from about ½ to ¾ mile off-shore, a little sheltered from shamals which blow from the northwestward, but some swell rolls in from the west-southwestward; there is no shelter from the kaus. There is much better shelter from shamals off Dayir, about 8 miles farther westward.

Supplies.—A few cattle and some vegetables might be obtained; there is good water in wells.

The coast from Kangun (lat. 27° 50′, long. 52° 03′) trends westward 25 miles, and then turns northwestward 19 miles to Ras al Khan; off the southwestern part lies Ras al Mutaf, a great shoal, the outer edge of which is distant 8 to 10 miles.

Mountains.—Two remarkable castle-shaped mountains, with vertical sides, and projections resembling bastions, lie 8 and 11 miles northwestward of the Fall; and 23 miles northwestward from the Fall is a round mountain about 4,000 feet high, which, from the salt deposits, glistens white in streaks when the sun shines on it; the range then trends northward toward Kuh Khormuj.

A detached group of mountains, of which Jabal Direng is the summit, lies between the ranges just mentioned and the coast, a valley separating them. Near Kangun, the coast range is from 2,000 to 3,000 feet high; from a distance it appears to form part of the back range, which, however, becomes obscured by it when close inshore; these mountains are rugged, precipitous, and of very irregular outline. It is said that, in some of the passes, ropes are required in ascending the most difficult parts; without ropes they are inaccessible.

Jabal Direng, 3,270 feet high, is at the northern end of the detached group of mountains, and 27° from Mukhaila, from which

the middle hummock is distant 18½ miles; it appears of even height, and either with one peak, or with from three to five hummocks on the top, according to its bearing. On northeasterly bearings they are in range, and the mountain shows one peak, with a great bluff on the northern side. Northward of it is an extensive low swampy plain.

This group decreases in height to the southward. Funnel hill, 14 miles, 165°, from the middle of Direng, is table-topped and about 800 feet high, with a small natural pillar on it, which is a good mark.

This coast is under the Chief of Dashti.

The coast from Kangun is low and sandy to Dayir, 8 miles to the westward, and is at the mouth of a great valley separating the mountain ranges; Dayir is near the southeastern end of the Direng range.

Bardistan (Bardistán), 7 miles westward of Kangun and 2 miles inland, is a town with a tall bad-gir or wind tower; it is near a khur, the mouth of which is about 2¼ miles southeastward. During rains the khur becomes a water course, and drains the valley.

Dayir (Daiyir) is a small town with a population of about 400, chiefly Persian and agricultural; it has a square fort with two towers, and some round trees; eastward of it is a large date grove. The shaikh's house is near the fort; it is a white two-storied building with a small flagstaff, from which the flag is flown. A reef extends from 200 to 400 yards offshore at Dayir, making landing difficult unless the boats can cross it.

The 20-fathom curve from 5 miles southward of Dayir trends southward about 10 miles, and then turns southwestward and westward.

Anchorage.—There is excellent anchorage off Dayir in shamals, but open to kaus, in 4 fathoms, with the fort bearing 0°, ½ mile; large vessels should anchor farther out in from 8 to 10 fathoms, mud. This anchorage is much used by bagalas for shelter during summer shamals.

Tidal currents.—The tidal currents attain a rate of from 1 to 2 knots along the coast off Dayir at springs.

Supplies.—Water, provisions in moderate quantities, and possibly a few cattle can be obtained at Dayir; vegetables are scarce; some firewood could be got from the interior in a few days.

Rocks.—There is a small rocky point of low cliff 2½ miles westward of Dayir, and 200 yards off the point are some sunken rocks; inside them, where a village, named Auli, was formerly situated, is a landing place. The Direng hills rise from the coast here, and for about 7 miles to the westward.

There is anchorage in about 6 fathoms ½ mile off the point, and good spring water can be obtained.

Batuna (Batúneh) (lat. 27° 50′, long. 51° 46′), 8 miles westward of Dayir, is a small coastal village with about 30 men. Sheep, poultry, and vegetables can be obtained in small quantities. The anchorage off the village is open both to shamals and kaus.

The coast from Batuna trends westward about 10 miles to Ras Umm al Kuram, and thence northwestward about 35 miles to Lawar village. There are several date groves along it, but there is no village near it northwestward to Lawar. The coast, which can not be approached owing to the extensive shoals off it, is imperfectly delineated, but it skirts the western side of the Direng hills.

Jezirat Umm al Kuram (Qurma), about 1 mile off Ras Umm al Kuram, is low, and less than 1 mile in extent. Umm Sila, about 4 miles northwestward of it, is a low sandy island.

Mukhaila (Nakhílu), about 6 miles, 258°, from Ras Umm al Kuram, and at the northwestern end of Ras al Mutaf shoals, is a low circular islet 800 yards in diameter, with the Shaikh's grave, a square building of loose stones, in the middle, and a cairn, about 5 feet high, on its northwestern extremity. There is a well of slightly brackish water on the island. Some date groves on the coast can just be seen from close off Mukhaila.

Tides.—It is high water, full and change, at Mukhaila, at 7 h. 30 m.; springs rise 8 feet.

Ras al Mutaf is the southwestern extremity of the shoal extending southeastward and eastward 18 miles from Mukhaila Islet. The shoal appears to be sand on a rocky base, and it is almost dry for many miles from its northwestern end, whence it deepens a little to its eastern end.

When surveyed in 1821–1829, its northwestern extremity was 700 yards outside Mukhaila, and its southwestern point, 11 miles, 139°, from that islet, but according to soundings obtained by a British naval vessel in 1892, the bank has altered, and probably extended both westward and southward. Its southwestern side, at the survey, was steep-to, there being 10 fathoms within the distance of ½ mile; on the southern side, the water shoaled gradually toward it from 10 fathoms at a distance of about 3 miles. Its eastern extremity was situated 7 miles, 169°, from Batuna, and from it a flat with 4 and 5 fathoms water extended 5 miles eastward and southeastward, with 10 fathoms water at a distance of 7 miles, whence the water gradually deepened to 20 and 35 fathoms.

In 1912 a sounding of 2 fathoms was obtained, with Funnel Hill bearing 348°, 13½ miles, and the shoal appears to be extending southward in this locality; there were soundings of 8 fathoms close southward of the 2-fathom sounding.

Khur Ayaz, inside Mutaf Shoal, is a channel with from 4 to 9 fathoms water, and its principal entrance is northward of the east-

ern end of the shoal; it trends westward and northwestward between the shoal and the mainland, continuing 7 miles beyond Mukhaila Islet, but there is no outlet at its northwestern end. The khur is used by small native craft, which leave it by a channel close northward of Mukhaila (lat. 27° 49′, long. 51° 28′), in which there are 2 fathoms at high water; the cairn and the shaikh's grave in range lead through.

Shoals extend from 2 to 3 miles from the mainland shore of Khur Ayaz, but a khur, said to have a depth of 10 fathoms, leads westward through them and passes inside Jesirat Umm al Kuram.

Shoal water has been reported in latitude 27° 33′, longitude 51° 13′ approximate. The bottom was plainly visible (1917).

Anchorage.—There is anchorage in 4 to 5 fathoms off the eastern end of Ras al Mutaf Shoal, sheltered from shamals, which here blow from the northwestward, but open to kaus, with Funnel Hill 330°, and Jabal Siri Ayenat 73°. As there is no good shelter from shamals between this anchorage and Abu Shahr, it is resorted to by vessels caught by a northwesterly gale in this locality.

Bank.—A bank with 8 fathoms water and from 12 to 17 fathoms around, lies with Funnel Hill bearing 39°, 22 miles.

Tidal currents.—The tidal currents are said to set west and east over the shoal, and appear to set northwest and southeast southwestward of it; the west-going current running from about 4 hours after high water until 2 hours before the next high water, and the east-going current from about 2 hours before until 4 hours after high water; the currents attain a rate of 2 knots at springs. This information can not be depended on. The currents are strong through Khur Ayaz, as well as in the khur behind, and along the outer side of Ras al Mutaf Shoal.

Directions.—Funnel Hill bearing 328° leads northeastward of Ras al Mutaf Shoal; the Fall 30° leads southeastward; Jabal Siri Ayenat 67° leads southward, and here the soundings are a guide. In rounding the shoal do not go into less than from 12 to 11 fathoms; but in thick weather, or at night, this shoal should not be approached to less than 15 fathoms. By day the discoloration of the water, which extends some miles off the shoal into deep water, is a good guide.

Jezirat Jabrin (Jabrín), the southeastern end of which is situated 1¾ miles northwestward of Mukhaila, is a narrow low strip of sand, with tufts of grass, extending northwestward 6 miles to Ras Jabrin, to which it is connected; it is uninhabited, but frequented by flamingoes, pelicans, and curlews. Between its southeastern end and Mukhaila is the boat channel into Khur Ayaz, above mentioned. Inside Jezirat Jabrin is an extensive swamp intersected by deep khurs, the mainland being distant about 5 miles; this swamp continues northward nearly to Lawar.

Jezirat Jabrin is known to the natives as Tahmadu, and the southern extremity of the island as Ras Tahmadu.

Ras al Khan (lat. 28° 02′, long. 51° 19′), 15 miles northwestward of Mukhaila, is the southern end of a very low sandy ridge, almost covered at high water; it, with the coast some 10 miles to the northward, projects considerably, and is part of the great valley northward of Jabal Direng. Inside the ras are extensive swamps, with many creeks, and this locality is probably the delta of the Mund River. In the valley is Burdekhun town, where the chief of the Dashti resides.

Southward of Ras al Khan is a small bay where native craft obtain indifferent shelter from shamals, in from 2 to 2½ fathoms water.

Khur Ziyarat is a small creek, with low banks, 7 miles northward of Ras al Khan; it can be entered by boats at high water, but the entrance from which Jabal Direng peak bears 98°, is open northwestward; there is a depth of about 4 feet on the bar, and of 9 feet in the channel for 2 miles inside. The khur is the mouth of the Mund River, the ancient Sitagon, which flows from near Shiraz, and, after rains, discharges a large quantity of water. Imam Ziyarat Village is in a date grove about 5 miles from the coast, but not on the bank of the khur. Quantities of grain from the country are shipped at landing places in the khur. There is open anchorage about 1½ miles off the entrance in 4 fathoms, mud, to which the water shoals gradually.

Caution.—As the coast from Mukhaila to a little northward of Khur Ziyarat is extremely low, caution is necessary when in its vicinity, especially at night or during thick weather, when the water should not be shoaled to less than 14 fathoms.

Soundings.—The 10-fathom curve is about 2½ to 5 miles and the 20-fathom curve 11 to 15 miles seaward of Mukhaila, Jezirat Jabrin, and the coast northward to Ras al Khan; toward Khur Ziyarat the 10-fathom curve is only 1 mile from the dry sandy ridge, and the 20-fathom curve 7 miles off-shore.

The coast from Khur Ziyarat trends north-northwestward 41 miles to the Abu Shahr Peninsula. The coast is swampy a little northward of Khur Ziyarat; it then becomes sandy, with small rocky points, and is steep-to at the distance of 200 yards; the plain seaward of the hills is from 1 to 2 miles wide.

Mountains.—A range of mountains (Kuh i Mund), with a rugged outline, commences about 3 miles northward of Khur Ziyarat, and continues about 36 miles along the coast, when it falls to the plain inland of Abu Shahr. Bu Riyal (Asses' Ears) Peak, 2,500 feet high, one of the summits, about 10 miles northward of Lawar village, is two pinnacles close together with a smaller one on the northern side;

it is conspicuous. There are other peaks on the range, two of which, situated about 2 and 3 miles northward of Bu Riyal, and higher than that peak, form a saddle or notch on southeasterly bearings.

Kuh Khormuj (Khurmúj) (lat. 28° 43′, long. 51° 28′), about 21 miles northeastward of Bu Riyal, is 6,500 feet high, and visible over all the coast ranges until close inshore; on northeasterly bearings it appears a long convex ridge, but on east-southeasterly bearings the ridge is end on, and shows a fine peak, with a long rounded slope to the northward. From it the back range trends southeastward.

Tidal currents.—The tidal currents are weak and often imperceptible off the coast from Ras al Khan to Abu Sahr.

Villages.—Lawar (Lavar), 17 miles northward of Ras al Khan, is a small coast village and fort. Kogan, a mile northward of Lawar, and Karri, 7 miles farther northward, are similar villages; there are large date groves and much cultivation at all of them.

Karri is the southernmost village in Tangistan. Good anchorage can be found in 4 fathoms at 1,600 yards from the village.

Baraki (Báraki) is the name of a district comprising several villages, each with a population of about 100 men, chiefly agricultural. Omari ('Omari) is 6 miles northward of Karri; Bulkhair, with a round tower near its north end, is 1 mile, and Gahi, on the south side of a low sandy point, 2¼ miles northward of Omari. Rustani, about 1 mile northward of the low sandy point, has a square mosque, with a tower on its south side, near its north end. There are a few date trees and some cultivation on the narrow plain between the hills and the coast. A little southward of these villages is the saman, or boundary, between the territories of the chiefs of Dashti and Tangistan.

Landing can generally be effected on the coast in this locality; there are several small points which afford protection from northwesterly winds.

The coast from Rustani trends northward 16 miles to the head of Halila Bay; 2 miles northward of Rustani is a rather conspicuous tree on a little cliff, and from 2 miles northward of this tree low cliffs extend some distance along the coast.

Bashi, 6 miles northward of Rustani, is a village with a large round tower and date grove. Here the Bu Riyal range bends inland, and ends a few miles to the northward, and the great plain within Abu Shahr commences.

Madumari (Nargiszar) and Dilwar (Dilbar), about 3 and 6 miles, respectively, northward of Bashi, are moderate-sized villages surrounded by date groves; Dilwar is the principal village of Tangistan.

Halila Bay lies between Bashi and Ras Halila, the southwestern extremity of Abu Sahr Peninsula, 14 miles northwestward, and its shores are low and sandy. There are less than 3 fathoms water within the bay, and less than 2 fathoms over its greater part, that depth being 5 miles offshore at Khur Khuweir; the bottom is chiefly mud.

Khur Khuweir, about 9 miles northward of Bashi and near the head of Halila Bay, is a small creek, the entrance to which dries; near the khur is a small fort and date grove.

Soundings.—Between Khur Ziyarat and Omari (lat. 28° 30′, long. 51° 06′), the coast can be approached by the lead, observing that between Khur Ziyarat and Lawar the water shoals quickly from 10 to 5 fathoms. There are depths of 10 fathoms 4 miles offshore at Omari, and from Khur Ziyarat the 20-fathom curve is about 10 miles distant off the coast northward to Abu Shahr.

Banks.—A 7-fathom patch was found in 1903, about 10 miles 273° from Bashi, the position is doubtful and "P. D." has been placed against them on the charts. There is a patch of 10 fathoms, with about 18 fathoms around, about 11 miles, 194° from Rishahr Point. A sounding of 11 fathoms was obtained in 1890, 31 miles, 268° from Rishahr Point. As these patches were not closely examined, there may be less water on them.

Shoal.—A shoal, with 3 fathoms of water over it, lies 1 mile 254° from Rishahr Point.

The coast.—About 2 miles northwestward of Khur Khuweir is the entrance to a large creek draining the great swampy plain inland of Abu Shahr. Dry sands extend about ¼ mile off its mouth, which nearly dries.

From the creek the coast of the mainland trends north-northwestward; it is very low and ill-defined, and in heavy rains is swampy for a considerable distance beyond the parts reached by the tide. The Mashila, a large salt-water swamp, lies between it and Abu Shahr Peninsula.

The coast of the peninsula from the creek trends westward about 4 miles to Ras Halila; the eastern part of the peninsula is a sandy spit, some 5 feet high, covered with tufts of coarse grass, and increasing in width from about 50 yards at its eastern end to a mile.

Ras Halila (Halíleh) (lat. 28° 50′, long. 50° 54′) is low, with a rocky spit extending 800 yards southwestward. Halila village, about 1,400 yards north-northwestward of the ras, is small, with about 100 men, chiefly agriculturists; it has a large square tower.

Anchorage.—There is good anchorage for small vessels during shamals, in 3 fathoms water, and about ½ mile offshore, with Ras Halila bearing 329°, or with the village tower and the ras in range.

Water can be obtained from wells about 1 mile eastward of the ras and 80 yards from the beach; the water is only 3 feet from the surface, and is better for shipping than any procurable near Abu Shahr. Close westward of the wells clumps of date trees extend across the peninsula.

The coast from Ras Halila trends northwestward 5½ miles to Rishahr Point; it is rocky with cliffs, and reefs extend off about 400 yards. There are two date clumps about a mile northward of Halila village, whence the ground rises to a table land about 150 feet high in the middle of the peninsula; Imamzada, on its highest part, is a conspicuous domed mosque; it is in a little village about 1½ miles eastward of Rishahr Point, which is celebrated for the fine grapes produced in its vicinity. The British country Residency, with its flagstaff, on about the highest part of the peninsula, ½ mile southward of Imamzada, is conspicuous. Rishahr (old) fort is a square or quadrangular space on the Rishahr mounds about 300 yards in extent, nearly ½ mile east-southeastward of Rishahr Point.

Rishahr Point (Rishehr).—Just eastward of Rishahr Point is a little bay with cliffs, on which is a white house; there is indifferent landing in calm weather on the shore here, but it is impossible with any wind or swell. The telegraph buildings, with a flagstaff, about ¾ mile north-northeastward of the point, are conspicuous, and the wireless masts, the central of which is about 200 feet high.

Anchorage.—A British naval vessel anchored in 1911 in about 4 fathoms water, 2 miles offshore, westward of the Telegraph buildings, and during a shamal the ship dragged her anchor; while the northwest-going current was running a very heavy sea was experienced, and it became necessary to go to sea. Another naval vessel anchored here in 1908, and rode out a shamal which lasted three days without dragging.

The depths in this anchorage were reported in 1907 to be from 3 to 4 feet less than charted.

Prohibited anchorage.—Anchorage is prohibited off Rishahr Point (lat. 28° 54′, long. 50° 49′) between lines drawn 220° and 265° from the white house on the point; on the latter bearing Imamzada and the white house are in alignment.

Lloyd's signal station.—There is a Lloyd's signal and telegraph station, under the Indo-European Telegraph Co., at Rishahr Point; communication can be made by International code and messages sent to and received from all parts. No lookout, however, is kept, and vessels desiring to communicate must first attract attention by means of the steam siren, or otherwise.

Time signal.—A time signal, direct from London, through Tehran, at 6 h. 0 m. 0 sec. a. m. Greenwich mean time, can be arranged, by the courtesy of the Indo-European Telegraph Co., daily.

The coast from Rishahr Point trends north-northwestward 2 miles to Ras ash Shaghab, which is the western part of a low wide sandy rounded projection. There is a small clump of date trees about ½ mile southward of the ras, where, close to the shore, is a well of good water.

The coast from Ras ash Shaghab trends north-northeastward, and is low and sandy for 3½ miles, when low cliffs about 15 feet high continue about ½ mile to the southern part of Abu Shahr (Bushire) town, which then extends to the northern point of the peninsula. The coast from Rishahr point to the town is fringed by a reef from 200 yards to ¼ mile broad, and in many places along its outer part rocky bowlders dry at half ebb.

Mufka (Nufka'eh), on the coast, 2 miles southward of the town, is a small fishing village, with a small boat harbor in the reef. A tower 40 feet high, intended for a lighthouse but never used, stands just northward of the village. The German consulate, at the southern end of the village, has high arched windows, two towers, and a flagstaff, and is conspicuous. The Russian consulate, on the coast 1¼ miles north-northeastward of Mufka, has also two towers.

Abu Shahr (Bushire) (Bushehr) (lat. 28° 59′, long. 50° 50′), the principal seaport of Persia, is situated on the north low point of Abu Shahr peninsula, which is 10½ miles long from Ras Halila to the town, with a greatest breadth of 3 miles.

From the north point of the peninsula, its northeastern coast, or the southwestern shore of Khur Sultani, trends southeastward nearly 2 miles to Ras Fudar, which is about 30 feet high; and thence the edge of the swamp trends south-southeastward nearly 5 miles to a low point. Along the land between the swamp and the rising ground toward Imamzada are groves of date trees and cultivated ground.

Caravans cross the swamp about 1 mile northward of the low point.

A little southward of the low point is Tangak Village, with a small fort, and from it the edge of the swamp trends southward.

The breadth of the Mashila, here is from 3 to 4 miles. For many miles from the swamp, and also to the northward, eastward of the harbor, the mainland is very low.

Muharrak Island, northeastward of Ras Fudar, and separated from it by the Khurs Sultani and Lashkari, is swampy, with some fishermen's huts on its western end, about 800 yards distant from Ras Fudar; thence it extends 1½ miles east-northeastward, and, being nowhere more than about 3 feet high, it mostly covers at high water springs.

Jezirat Sheikh Saad, on the eastern side of Abu Shahr harbor, is 4 miles long north and south, and low. A large village and a small

tower, 50 feet high, stands on the north rocky point, which is about 10 feet high. Many large boats belong to the village, and the inhabitants carry on the traffic between Abu Shahr and Shif. There is no fresh water here except after rain.

There is a conspicuous single palm tree, 2½ miles southward of the tower. The island is swampy, except a narrow strip along its north and west coasts; the southern end is separated from Muharrak by a channel ½ mile wide, which nearly dries. Bar Abbasak (lat. 29° 01′, long. 50° 52′), the quarantine station, is about 1 mile from the southern end of the island.

Shif, 1½ miles eastward of the tower on Sheikh Saad, is a rocky point, about 25 feet high, on which is a small house; it is the only landing place on the mainland near Abu Shahr, and much of the supplies from the interior for that town are shipped here. Eastward of Shif the country is low, barren, and partly swampy for some miles, and there are extensive swamps northward of it to Ruhilla.

The north shore of the harbor from Shif to Ras ash Shatt, 12 miles to the westward, is extensive mud banks intersected by numerous large and deep khurs, the entrances to which are shallow; there are some sand knolls on the mud banks, generally above water, but covered at high water springs.

Ras ash Shatt, 11 miles northwestward of the north point of Abu Shahr peninsula, is a narrow strip of sand scarcely above high water, inside which a swamp, intersected by numerous creeks, extends many miles; the creeks have fairly deep water inside, but only 2 feet at the entrance. The ras, with the banks off it, shelters the harbor of Abu Shahr from shamals.

Approach—Depths.—The coast from Ras Halila to about 1 mile northward of Mufka is fringed by a rocky reef to a distance of from 200 yards to ¼ mile, already mentioned. The 3-fathom curve, from about 800 yards off Rishahr Point, trends north-northwestward to about 1½ miles off Ras ash Shatt, but a bight, the entrance to which is about 1 mile wide, with from 3¾ to 3¼ fathoms, extends northward to about 1,200 yards off Mufka. The 5-fathom curve from about 2¼ miles off Rishahr Point trends north-northwestward to a similar distance off Ras ash Shatt. The 20-fathom curve is about 13 miles off Ras Halila and 9 miles off Ras ash Shatt.

Westward of the town the 3-fathom curve is 3 miles offshore, and thence a flat with depths of from 2¾ to 2¼ fathoms extends to Rakat as Safli, Ras al Marg, and Rakat al Aali; there are two 2-fathom patches about 1½ miles westward of the town. The flat extends southward to 1½ miles northwestward of Ras ash Shaghab.

In less than 1½ fathoms water the bottom is hard sand; it becomes sand and mud and softer in deeper water.

Banks.—A series of shallow sand banks, drying in places, lies westward and northward of the town; the outer edge, with 2 fathoms water, commences about 600 yards off the Russian Consulate and trends north-northwestward 3 miles.

Rakat as Safli, the part of the banks extending about 1 mile northwestward from the town, dries about 2 feet in patches. There are three small channels through it, which are used at high water by boats bound between Khur Sultani and the vessels in the outer anchorage.

Ras al Marg (lat. 29° 01′, long. 50° 48′), the northwestern part of the banks (beacon, below), is steep-to. It is reported to be extending to the westward.

Lafka sands, with from 2 to 3 feet water, extend eastward 1.3 miles from Ras al Marg to Ras al Jabri, their eastern end, and are on the southeastern side of the inner anchorage; the sea seldom breaks on the sands, except at very low water or during strong winds.

Rakat al Aali, with less than 2 fathoms water, extends southward from the shore eastward of Ras ash Shatt to about 3 miles west-northwestward of the north point of Abu Shahr peninsula.

Buoys.—A black buoy, with staff and flag, is moored in about 3¼ fathoms northward of Ras al Marg, the western extremity of Lakfa Sands; a red conical buoy is moored in the fairway to Khor Sultani, at 1¼ miles northward of Bushire, and a black and white vertically-striped buoy farther in, on the west side of Alafdan sandbank, east side of entrance to the Khor.

Lights.—Two lights, placed vertically, are exhibited from the British (town) Residency flagstaff; one fixed white, 72 feet above high water, visible 13 miles; the other, fixed red, 54 feet above high water, visible 11 miles.

Lightbuoys.—A lightbuoy, exhibiting an occulting white light, is moored in the outer anchorage in 4¾ fathoms water, 4¼ miles westward from the British (town) Residency.

A lightbuoy, exhibiting an occulting red light, is moored, in 2¾ fathoms water, on the southeastern side of Rakat al Aali, and 2½ miles northwestward from the residency.

These buoys are painted red. The outer buoy is surmounted by a black cage with a white horizontal band, the inner buoy by a black cage.

Prohibited anchorage.—Anchorage is prohibited within a distance of 600 yards from the outer lightbuoy.

Outer anchorage.—The outer anchorage, situated with the British (town) Residency flagstaff bearing about 81° from 4 to 4½ miles, in from 4½ to 5 fathoms water, is open to shamals and kaus. Vessels of too deep draft to enter the inner anchorage, anchor here, and boats can fetch off with the prevailing winds.

In fine weather and for a short stay, a small steam vessel can anchor with the Residency flagstaff bearing 45°, distant about 1 mile, in 2¼ fathoms water. Boats can land near the flagstaff.

Inner anchorage.—The harbor or inner anchorage, called by the natives Khur Deira, is a channel from 600 yards to ½ mile wide, with from 3¼ to 3¾ fathoms water, mud, and good holding ground, extending about 1½ miles northeastward between Ras al Marg and Rakat al Aali. There is a depth of 2½ fathoms over the flat in its approach, and the bottom is everywhere soft mud; steam vessels of 15 feet and less draft enter the anchorage at any time of tide unless a shamal is blowing, while steamers of 20 feet draft can generally enter on the higher tide of the day. The further northeastward in the anchorage the better the shelter during a shamal. A good position is in about 3½ fathoms water, 800 yards north-northeastward of Ras al Marg beacon, with the flagstaff of the Persian Governor's house bearing 149°, and the solitary palm northward of Bar Abbasak 90°.

The banks on both sides are hard sand.

Small native vessels anchor under shelter of the Lakfa sands, in from 1 to 1¼ fathoms, southeastward of Ras al Jabri (lat. 29° 01′, long. 50° 50′); this anchorage is locally known as Bandar al Ghawi.

Tides and tidal currents.—It is high water, full and change, at Abu Shahr at 7 h. 43 m.; springs rise 6 feet, neaps 5 feet. The Tide Tables for Standard Ports give the times of high and low water, with the tidal rise, daily throughout the year. In summer the day tides, and in winter the night tides, are the highest, the rise of the lower tide being very small.

The winds affect the tide considerably, the shamal making it later and lowering the general level of the water, sometimes as much as one foot, while the kaus raises the level of the water.

The July spring tide is the highest in the year.

The tidal currents in the offing set up and down the coast, but are weak.

In the entrance to the harbor the current sets northward during the flood tide, and near Rakat as Safli eastward, across it into Khur Sultani; the current sets in the reverse directions during the ebb tide. In the inner anchorage, the currents set from north-northeast to east-northeast and from south-southwest to west-southwest, at a velocity of 1 knot at springs, and from ½ to ¼ knot at neaps, the currents are weak on the shoal flats northward and eastward of the anchorage.

The currents are very strong in Khur Sultani, off the town, and also round the northern end of Jezirat Sheikh Saad.

Pilots.—A pilot will always come off to a vessel, weather permitting, and a vessel requiring one should wait in about 4 fathoms in

the outer anchorage. A vessel of more than 15 feet draft must wait a flood tide.

Pilots for the Shatt al Arab can usually be obtained here.

Boat channel.—Small buoys are moored to mark the channel for boats proceeding from the landing place to vessels in the inner anchorage. There is a least depth of 4 feet at low water in this channel.

Directions.—In clear weather, from a distance, bearings of Gisakan Bluff, Kuh Khormuj, or Bu Riyal, will determine a vessel's position.

The buoys are not to be depended on.

From the southeastward steer to pass about 6 miles off Ras al Halifa, and then continue northwestward, in not less than 6 fathoms water, and anchor according to draft southward of the light buoy at the outer anchorage. From southwestward of the peninsula, and in about 20 fathoms, Imamzada mosque and the British country residency and telegraph buildings at Rishahr will be first seen, showing white, especially in the afternoon. The depth decreases regularly as the coast is approached.

Khor Pooda, the southeastern branch, extends southeastward from Pooda village and Ras Fudar; it runs through a sandy plain, which covers at high water springs for many miles around; it is about 300 yards wide in the entrance, but reduced to 50 yards in places farther up; it has several branches, as charted.

A small vessel can keep near the land, according to draft.

At night steer northwestward, in not less than 10 fathoms water off the peninsula, and make the lights at the British residency and the light of the outer anchorage lightbuoy. If in doubt as to position anchor anywhere in a convenient depth and wait for daylight.

From the northward, in passing Ras ash Shatt (lat. 29° 06′, long. 50° 40′), which is nearly covered at high water, do not shoal the water to less than 10 fathoms, and keep in that depth until the outer anchorage lightbuoy is sighted. At night Abu Shahr lights should be sighted when a little southward of Ras ash Shatt.

Inner anchorage.—The German and Russian consulates, British (town) residency flagstaff, the conspicuous solitary palm northward of Bar Abbasak, and the village at the northern end of Jezirat Sheikh Saad are good marks for fixing the position.

From the outer anchorage, approach with the British (town) residency flagstaff bearing 76°; when the German consulate bears 135° steer 0°, and when the residency flagstaff bears 108°, steer 28° to the anchorage, leaving the inner anchorage lightbuoy to the westward and Ras al Marg beacon to the eastward; the least water by this route is 2½ fathoms.

Mail steamers keep the residency flagstaff bearing 81° until the German consulate bears 138°, and then steer 17° to the anchorage: the least water by this route is 2¼ fathoms.

From the westward it may be convenient to approach with the residency flagstaff bearing 103° until the German consulate bears 149°, then steering 28° to the anchorage; there is a least depth of 2¼ fathoms by this route.

From the southward a vessel can pass about 1 mile off Ras ash Shaghab, and steer 359° till the residency flagstaff bears 108° when a 28° course leads to the anchorage; the least water by this route is 2½ fathoms.

Khur Sultani is a large creek with a shallow bar, by which boats of light draft run up to the bund or embankment at Abu Shahr. It passes close along the eastern side of the town, where it is 200 yards wide, with from 4 to 7 fathoms, hard bottom; thence it widens and runs southeastward between Ras Fudar (lat. 28° 58′, long. 50° 52′), and Muharrak Island, where it bifurcates, the principal branch, Khur Lashkari, running northeastward southward of Jezirat Muharrak and Sheikh Saad.

On the eastern side of Khur Sultani a rocky bank extends 2 miles northwestward from Muharrak Island, ending in the point of Alafdan Shoal, 1 mile northward of the town. Abreast of this bank the entrance to Khur Sultani is about ½ mile wide, and has from 1 to 1¼ fathoms water; to the northward the channel spreads out over the great flat extending to the Lakfa Sands, with from about ¾ to 1 fathom water.

There are three entrances to Khur Sultani across this flat, one just southward of Ras al Marg, known as Khur Bahrani, and used only by small boats; the second eastward and southward of Ras al Jabri through Bandar al Ghawi; and the third and best about 400 yards northeastward of Ras al Marg beacon. Small craft using this channel, which has ¾ fathom least water, keep the Imamzada midway between the gate leading into, and the southwest corner of the wall surrounding, the Russian Consulate, 164°, and, when through the sands, bring the governor's flagstaff just open eastward of the customhouse, 152°, which leads into the khur.

Bagalas of 10 feet draft enter the khur by this passage. Boats of 7 feet draft enter at ordinary high water. Light draft gunboats have often entered and anchored near the town, but nothing larger than a bagala has done so for many years.

Khur Bandarga, by which Shif is approached, runs close round the northern end of Jezirat Sheikh Saad, and has 8 fathoms water off the tower, where it turns southeastward, passing 800 yards westward of Shif; it then continues a narrow boat channel eastward of

the island. The bar of the khur, 1¼ miles westward of the tower, has 3 feet water.

The water is very shoal westward of Jezirat Sheikh Saad, and between it and Muharrak a rocky flat projects about 1 mile.

Tihimiya Point, 1¾ miles north-northwestward of Jezirat Sheikh Saad, is a small sandy projection, with rocks extending some distance off it; here people journeying into the interior sometimes land at high water.

Abu Shahr (Bushire) (Bushehr) Town (lat. 28° 59′, long. 50° 50′) on the northern part of Abu Shahr Peninsula, a rocky ridge which does not exceed 40 feet in height, has a perimeter of about 1¾ miles. It is poorly built, the streets are narrow and dirty, and there is no attempt at draining, paving, or lighting. There is a wall, with many towers, on the land side, but numerous buildings have been erected outside it, and it is scarcely distinguishable from them; there are several bad-girs or wind towers, but they are not conspicuous.

Southward of the town, for upward of 1 mile, the ground is swampy, and, except a narrow strip along the west coast, covers at very high water. The land rises in a gradual slope to Imamzada Village and is partially cultivated; there are also several small hamlets, and many wells.

Abu Shahr is the headquarters of the Persian Province of the Gulf ports, and the governor resides in a square fort at the southeastern corner of the town. The garrison of the town and district consists of about 200 infantry and about 20 gunners, principally Persians and Arabs. The European community numbers about 40 persons. The people are more Arab in blood than Persian, and they are occupied in seafaring, agriculture, and trade. There is a small Christian church in the town.

Abu Shahr is the headquarters of the British political resident in the Persian Gulf. The town residency is a large building at the southwestern corner, with a flagstaff close to it, and is now used for office purposes, the resident living at the residency ½ mile southward of Imamzada. Near the town residency is the flagstaff of the Turkish consulate.

Consulates.—The Russian consulate is ¾ mile southward of the British town residency; it is a conspicuous building with two towers and is surrounded by an extensive wall; on its northern tower is a flagstaff. The German, Dutch, and French consulates are farther southward, away from the town.

Landing.—There are neither wharves nor piers. The only landing place is in Khur Sultani, where a good bund has been formed, and here all cargo is shipped and landed; the portion of the bund in general use is about 75 yards in length, and has a depth of about 2 feet alongside. Boats are allowed to land at and to leave the bund

during daylight; at other times special permission must be obtained from the customs passport department.

Health.—Plague first appeared in Abu Shahr in 1910, and it was followed by severe outbreaks in 1911 and 1912; it reappeared in a very mild form in 1913. The town is otherwise healthy, especially during the hot summer.

Quarantine.—The surgeon of the British residency is the port health officer. The quarantine regulations are very strict, and the authorities enforce all penalties. The quarantine station is at Bar Abbasak (lat. 29° 01′, long. 50° 52′). Passengers less than 10 days out from Bombay, or other infected ports, are landed here, to their great discomfort, but those who are allowed to do their quarantine on board their vessel are required to pay the same fees as those who are landed, in order to maintain the quarantine establishment.

Repairs can not be executed.

Supplies.—Cattle, meat, and bread are procurable, but not salt meat. Vegetables are plentiful from January to March, although at other times they can not always be obtained. The water is generally bad and undrinkable.

Water for boilers can be sent off in dhows, 5 tons at a time.

Coal.—In normal times from 1,500 to 3,000 tons of coal was in stock. It is taken off to vessels in the anchorages in lighters of from 20 to 25 tons, of which there are 12, but in fine weather only. There is a limited supply of firewood.

Two steam launches are kept here to assist in discharging colliers and transports.

Trade.—Abu Shahr is the port and terminus for the great and ancient caravan route which runs through Kazarun to Shiraz and Isfahan, and thence on to Tehran. A portion of the supplies and stocks is required for consumption in the town and its vicinity, but the larger part is intended to supply the great centers of Shiraz and Isfahan, which are respectively the capitals of provinces.

The customs duties are very high and the regulations said to be most irksome. Nevertheless, a considerable trade is carried on with Basra, India, Great Britain, Turkey, Egypt, and various European ports, the traffic with the interior being mainly mule caravan. The distance to Shiraz is about 170 miles.

Exports.—The chief exports are wheat, barley, and other grain, dates, almonds and pistachios, rose-water, drugs, gum insoluble and gum tragacanth, cotton, wool, woollen carpets, opium, skins, and unmanufactured tobacco.

Imports.—The chief imports are matches, timber, candles, rice, sugar, tea, drugs, spices, clothing, kerosene, iron manufactures, copper and nickel, cotton, wool, mercery and haberdashery, furniture, skins, earthenware and chinaware, indigo, and glass.

Currency.—In the district nickel pieces of 1 and 2 shahis, silver pieces of 1 kran (very few), 2 and 5 krans (few) are current, as well as Imperial Bank of Persia notes of 1, 2, 3, 5, 10, etc., tumans.

In the town of Abu Shahr rupees and sovereigns are commonly accepted.

Weights.—The weights of importance are: 16 kiass=1 Bushire man (7.75 pounds); 1 Shiraz man=7.36 pounds; 1 Hashem man in Bushire=124 pounds; 1 Tabriz or customs man (also called batman)= 6.54 pounds; 1 kharwar=100 batmans (654 pounds).

Communication.—The vessels of the British India Steam Navigation Co.'s fast mail service, and also those of their subsidiary mail service, between Bombay and Basra call at Abu Shahr (lat. 28° 59′, long. 50° 50′) weekly both on their passage up and down the gulf.

Transport between Abu Shahr and the interior is effected almost entirely by mules. The main caravan route to Shiraz is the only road of importance, and part of it, which traverses four steep mountain ranges, is precipitous and very difficult.

The British Indian post office is situated in the British town residency.

The telegraph office at Abu Shahr is always open.

There are both British and Persian post and telegraph departments; the latter is only used for communication with the interior and is very slow and unreliable.

Shipping.—The boats of Abu Shahr (lat. 28° 59′, long. 50° 50′) fly a red flag, with a white two-edged sword in the center.

CHAPTER XI.

PERSIAN GULF, NORTHEAST SHORE AND HEAD.

ABU SHAHR (BUSHIRE) TO, AND INCLUDING, THE SHATT AL ARAB.

(Lat. 29° 05′, long. 50° 40′, to lat. 33° 30′, long. 44° 20′.)

The coast.—Ranges of mountains lie some distance inland from the coast between Abu Shahr and the deltas of the great rivers; but for many miles toward the interior the land is low with banks extending some distance off. Southward of Duhat Dilam there are no detached shoals off the coast. The gulf shoals gradually toward the head from the greatest depth of 38 fathoms, about 40 miles westward of Abu Shahr. The towns northward of Abu Shahr are small and the population chiefly Persian.

Mountains.—Some 15 miles to the northward of Kuh Khormuj and 26 miles eastward of Abu Shahr, is a mountain ridge about 4,000 feet high, deeply furrowed, with a lump on each end, and a third lump near the middle. Gisakan Bluff, 5,350 feet high, situated about 22 miles northward of the 4,000-foot summit and 33 miles northeastward of Abu Shahr, is at the northern end of a range which has a step on the top. About 41 miles northeastward of this bluff is a round-topped mountain, 10,200 feet high, which is snowclad in winter. Northward of Gisakan Bluff the mountain range is more inland, and appears generally to be lower; it continues to stretch northward, leaving a great plain toward the sea.

Tides and tidal currents.—The time of high water, full and change, varies from 7 h. 43 m. at Abu Shahr to about 11 h. 30 m. on the bar of the Shatt al Arab. The tidal currents are felt along the shore and, northward of the parallel of Jezirat Kharag (lat. 29° 15′, long. 50° 21′), the whole way across the gulf, the velocity increasing toward the rivers. The northgoing current sets along the Persian coast, as well as directly into the mouths of the rivers.

The coast from Ras ash Shatt trends north-northwestward 73 miles, to the head of Duhat Dilam (lat. 30° 11′, long. 50° 5′), the northeastern bight of the Persian Gulf, and thence west-southwestward 28 miles to Ras ul Bahrgan, where the delta of the Mesopotamian rivers commences. Northward of the parallel of Jezirat Khargu, the depth is less than 20 fathoms across the gulf, and it decreases toward the rivers.

The coast is low, and the mountains are some distance inland, with the exception of Kuh-i-Bang (Jabal Bag or Bang), 1,000 feet high, which lies 30 miles northward of Kharag Fort. The summit of this hill is 2 miles inland, and has a precipitous face to seaward; from the southward it shows a remarkable bluff. The range of which it is part extends 12 miles parallel with the coast.

Northward of Gisakan Bluff are a series of ranges from 30 to 40 miles inland, over which can be seen the summits of much higher mountains, covered with snow in winter. Separated from Kuh-i-Bang by a valley, is a range about 15 miles inland, from 2,000 to 3,000 feet high, but with no conspicuous peak. Its southern end is 26 miles north-northeastward of Ras ash Shatt; the country to the southward appears to be low inland to the Gisakan Range.

A range of lower hills, trending east and west, comes within 4 miles of the head of Duhat Dilam, and thence turns nothwestward into the interior, decreasing in height; this range is the westernmost of the Persian hills, the whole head of the gulf being a low alluvial plain. On this range, 25 miles eastward from Dilam Town, is a sharp peak, and 26 miles northwestward from that town is Funnel Hill, 550 feet high.

Kuh Bebehan (Behbehán), 47 miles northeastward of Dilam Town, is a great mountain of irregular outline, lying east and west; the summit is 10,400 feet high, and is snowclad for six months in the year.

Tidal currents.—The tidal currents set northward and southward along the coast northward to Duhat Dilam, between which and Ras ul Bahrgan they set southwestward and northeastward; the velocity of the currents is from 1 to 1½ knots. The velocity increases to about 2 and 3 knots as the rivers are approached.

The coast from Ras ash Shatt trends north-northwestward 5 miles to the entrance to Khur Ruhilla and is low and sandy, with a few tufts of grass; the 5-fathom curve is about 2½ miles, and the 3-fathom curve 1½ miles, off it.

Khur Ruhilla (Rúd Hilleh) is the mouth of Ruhilla River, which is formed by the junction of the Shapur and Daliki Rivers about 30 miles inland; the Ruhilla regularly floods after the melting of the snow in the mountains.

The khur is navigable by small craft to Ruhilla Village, which is situated near a clump of date trees 6 miles northeastward of the entrance. The entrance is shallow, and the banks cover at high water.

There are several other khurs in this locality; all the entrances are shallow with deeper water inside.

The output of grain from the port of Khur Ruhilla was 2,711 tons.

Jezirat Kharag, 19 miles west-northwestward of Ras ash Shatt and about 16 miles westward of the coast northward of Khur Ruhilla, is 4¼ miles long north-northwest and south-southeast, and about 2½ miles broad. A range of table topped hills extends, north and south, through the island, and on a hill, 284 feet high, near the middle, is a small tomb known as Dedabuun or Muhammad's watchman (lat. 29° 15′, long. 50° 19′); there are several similar tombs on the island. The hills at the southern point end in precipitous bluffs with detached table lumps, and northwestward they decrease in height and terminate in cliffs from 20 to 30 feet high. Near the middle of the northern end of the island is a quoin shaped hill about 200 feet high, with a small building on the summit, somewhat conspicuous except from the northward.

The west coast is a series of rocky points with sandy beaches between, the hills ending abruptly in cliffs; the east coast is sandy. On the eastern side is a cultivated plain, a mile in extent, terminating in Fort Point, the low sandy northeastern extremity, on which are the ruins of a fort and a village, with a population of about 500, mostly fishermen. The best landing at low water is northward of the eastern angle of the fort; at high water there is landing anywhere along the beach inside the reef.

Kharag is surrounded by a fringing rocky reef, which extends about 800 yards off the south and west coasts; ½ mile off the north coast, and 600 yards off the east coast, where there are from 4 to 7 fathoms close outside it. A sandspit extends 1,600 yards eastward from Fort Point, with 3½ fathoms water close to the point, 4½ fathoms about the middle, 6 fathoms at the outer end, and 10 fathoms just eastward of it; there are from 6 to 8 fathoms close to the spit on either side.

The island on moonlight nights sometimes shows as a white streak, but not until close to; on a dark night, from its brown color, it can seldom be seen.

Anchorage.—The most convenient summer anchorage, sheltered from shamals, is on the eastern side, in about 8 fathoms, 800 yards offshore, with the quoin-shaped hill pust open southward of the fort. In winter anchor farther out in about 10 fathoms, so that should a kaus come on the vessel could sift to northwestward of the fort and anchor in 7 fathoms, with the eastern angle of the fort bearing 160°, about 1,800 yards, where there would then be shelter. The holding ground, however, is rocky and indifferent, and during winter be ready to shift berth to either side of the point; when the necessity for shifting has become apparent, the change should be effected without delay.

Vessels from the anchorage or from abreast of Jezirat Kharag, if bound for the Shatt al Arab, steer direct to the light vessel.

Supplies.—Fowls, eggs, milk, fish, and a few vegetables can be obtained from the natives. There are good wells near the east coast. There are many gazelles on the hills and large flocks of goats.

Jezirat Khargu, the southern end of which (lat. 29° 18′, long. 50° 20′) is 2¼ miles northward of Fort Point, is 3 miles long north-northeast and south-southwest, 800 yards broad, and very low white sand. It is barren and uninhabited, but has a conspicuous tree about 1 mile from its southern end.

The island can not be seen at night until dangerously close to it.

The northern end of Khargu is steep-to; a flat, rock reef extends from 1,000 to 1,600 yards off the west and south coasts, with from 6 to 10 fathoms close outside it, but from the southern part of the reef there is an extension with 4 and 4½ fathoms, rock, for ½ mile to the southeastward; foul ground extends about ½ mile from the east coast with from 12 to 15 fathoms 400 yards off it. The best landing is at the northeastern point.

Channel.—In the channel between Jezair Kharag and Khargu the fairway between the reefs is 1 mile wide; the soundings are irregular from 5 to 9 fathoms, hard bottom, and these depths are carried close to the reefs.

Soundings.—The western and southern sides of Jezirat Kharag coast reef are steep-to, and the 20-fathom curve is from 1½ to 2 miles seaward of that island. There is a depth of 21 fathoms 6 miles eastward of the southern part of the island, whence the depth decreases to 12 fathoms 1 mile from the island. There is also a depth of 25 fathoms 2 miles northeastward of Jezirat Khargu. Westward of Khargu there are depths of 12 fathoms close to the reef, increasing to 20 fathoms at the distance of about 4 miles.

Tides and tidal currents.—It is high water, full and change, at Jezirat Kharag at 8 h. 0 m.; springs rise 6½ feet. The tidal currents near these islands set northwest and southeast at a velocity sometimes exceeding 2 knots.

The coast from Khur Ruhilla trends northward 17 miles to Bandar Rig; it is low and sandy, and the 3-fathom curve is distant about 2 miles. Khur Gasair, about half way between Ruhilla and Bandar Rig, is frequented by large boats; there is a small village near its mouth.

Bandar Rig (Rig) (lat. 29° 28′, long. 50° 38′) is a small town northward of some date trees, inhabited partly by Arabs of Al Zaab Tribe. There is a small khur at the town, fronted by two sandy islets or banks, inside which native boats lie and take the ground at low water. Much grain is exported from this place to other parts of the gulf. It and the adjacent country are under the governor of the gulf ports.

The coast from Bandar Rig trends northwestward 15 miles to Sabz Pushan Point; it is low and sandy. The 5-fathom curve is about 3½ miles, and the 3-fathom curve 1½ miles off it.

Kanawa (Ganaveh), about 8 miles northwestward of Bandar Rig, and ½ mile inland, is a large village, with a few date and other trees, and a large tomb with a spire. The inhabitants are chiefly agricultural. Just northwestward of the village is a large round banyan tree, very conspicuous. There is anchorage southwestward of the banyan tree in 3 fathoms nearly 1½ miles offshore; large vessels anchor farther out. The landing at low water is bad, as several ridges of dry sand, with about 2 feet water inside them, must be crossed.

The country to the northward is under the Khan of Bebehan.

Khur Khalil is the mouth of a tidal river, 1¼ miles southward of Kanawa banyan tree; sands, which dry, extend about 400 yards off it. The Kanawa boats enter the khur at high water, and carry on a small coasting trade.

Kalat Haidar, 4 miles northwestward of Kanawa, is a small village with a few date trees near it; the inhabitants are agricultural and are a poor but civil people, though wild in appearance.

Supplies.—Very good fowls, cattle, and vegetables are obtainable at Kanawa.

Sabz Pushan (Sabzpúshán) is a slightly projecting rocky point, rising steeply to hillocks from 40 to 50 feet high. On the summit is a small tomb, which can only be seen when close in. A rocky reef extends about 300 yards from the plant, and there is a little watercourse close eastward of it.

The coast from Sabz Pushan trends northwestward 24 miles to Ras at Tanb. A small tomb stands on the coast hillocks, which are about 50 feet high, 7 miles northwestward of Sabz Pushan, under the highest part of Kuh-i-Bang; the land between it and Kuh-i-Bang is undulating, but rises toward the range. Between Sabz Pushan and the tomb, no reef extends more than 400 yards, and the 5-fathom curve is about 1½ miles off the coast, whence the water deepens to 10 fathoms at the distance of 4 miles.

Khur Sini, 17 miles northwestward of Sabz Pushan, is small, with deep water in it. Southward of it is Imam Husein (Imam Hasan), a conspicuous old mosque, with a small village and some trees near it. Khur al Abd, about 4 miles northwestward of Khur Sini, is small, and Khur Lulatain (Lailatain), about 3 miles farther northwestward, is also small. The 5-fathom curve is about 2 miles off the coast at the tomb under Kuh-i-Bang, and 5 miles off Ras at Tanb; the depths decrease to the northward, the 10-fathom curve trending westward from about 10 miles westward of Kuh-i-Bang.

Ras at Tanb (lat. 29° 59′, long. 50° 09′) is the low sandy southern point of Duhat Dilam; dry sands extend nearly 1 mile off it and shallows some distance beyond. The land inshore of the sandy coast is swampy for many miles.

Duhat Dilam lies between Ras at Tanb and Ras ul Bahrgan, about 30 miles to the westward; the shore is everywhere very low, and the 3-fathom curve is generally from 2 to 4 miles offshore, about 8 miles eastward of Ras at Tanb there is, however, a small table hill, 165 feet high, of light color, with vertical sides. In the plain northward of this hill are several forts and date groves. There are depths of 8 fathoms and less in the bay.

Dilam, about 6 miles northward of Ras at Tanb, is a town and fort. The square fort, in and around which the houses are built, is first seen when approaching it. About ½ mile southward of the fort are a few round trees, with a little cultivation.

Mud flats dry off the town, rendering landing difficult; in these flats is a small creek, which dries, where native craft lie, their cargoes being loaded and unloaded on donkeys.

The shore of the bay here is a mere strip of rocky land from 10 to 15 feet high, from which swamps extend several miles inland. There is a small fort 1¼ miles northeastward of the town near some wells, from which the town is supplied with water.

Anchorage.—There is anchorage in 4 fathoms, soft mud, about 3¼ miles off the town; it is sheltered in shamals, but kaus probably cause much sea, though there is even then partial shelter.

Supplies.—Fish, cattle, and poultry are plentiful and easily obtainable. Water is expensive and indifferent.

Trade.—Dilam is the port of the district of Bebehan; grain, cotton, wool, ghi, etc., are exported, chiefly to Abu Shahr and Kuweit.

Communication.—Dilam is in telegraphic communication with Abu Shahr (Bushire).

Shad Abul Shah (Sháh Abul Sháh), on the hillocks at the head of Duhat Dilam, and 8 miles north-northwestward of Dilam, is a village with a large white domed tomb.

It has a small creek and some coasting trade.

The shore of the bay from Shah Abul Shah trends west-southwestward 28 miles to Ras ul Bahrgan, and shoal water extends nearly 4 miles off it. The soundings are regular, and it is safe to approach by the lead. The range of hills, which approaches to about 3 miles northward of Shah Abul Shah, turns northwestward from about 8 miles northwestward of that village, and thence the land is exceedingly low across the head of the gulf to Kuweit, being the delta of the great rivers.

Ras ul Bahrgan (lat. 30° 01′, long. 49° 35′) is a very low strip of sand nearly covered at high water, with 3 fathoms water 4 miles to the southward; inland, it is swampy for some miles. There are some date groves 3 miles from the point, and Mir Amman Tomb, probably on the banks of Hindiyan River. Mud flats, covered at high water, extend some miles on each side of the point, and ½ mile offshore on its southeastern side, so that for some miles eastward of the ras the soft mud makes landing impossible.

Hindiyan River enters the gulf a few miles northwestward of Ras ul Bahrgan by apparently several mouths, but by one main channel, through a delta. The town of Hindiyan is about 30 miles up the river, which is very winding, some of the reaches approaching within 2 miles of the coast eastward of Ras ul Bahrgan, so that native boats, lying outside, send across to the river for water. The population of the town is about 500; it is a port for native craft, and cereals are exported.

Sirima, about 9 miles northwestward of Ras ul Bahrgan, is a small cluster of trees on the low shore; it is a mark for the entrance of Hindiyan River, whose delta lies between these trees and the ras.

The principal entrance to the Hindiyan is very shallow, and has been put partially surveyed. The approach to it, through the mud flat, is marked by poles with tins for topmarks, and a steamer of 8 feet draft has ascended as far as Hindiyan. As a rule, the craft using this river are of from 20 to 30 tons. Ab Kateh is a small village about 6 miles up the river.

Ras at Tullub, 17 miles west-northwestward of Ras ul Bahrgan, is a low projection of the mainland. About 1¼ miles northwestward of it is the mouth of a river or creek, with extensive ruins on its banks. The coast northwestward of this point is nearly all covered at high water and has not been traced.

Fasht al Miairiz, extending about 12 miles south-southeastward from Ras at Tullub, is sand and mud, and dries in patches. It is separated from Ras at Tullub by Khur Ghazlan, a narrow passage with about 6 feet water. Khur Bahrgan, between Fasht al Miairiz and Ras ul Bahrgan flats, is about 3¼ miles wide, with from 3 to 1½ fathoms water, and leads into Khur Ghazlan.

Banna, 2 miles westward of Ras at Tullub, is a low narrow island 3½ miles long east and west, with a ruin on it.

Daira Island (Dairah), 3½ miles southwestward of Banna, and separated from it by Khur Wasta, is low and partly swampy. Aich Shaham, 3 miles southward of Daira, is a small sand bank with less than 6 feet water, and from 3 to 6 fathoms around.

Northward of these islands, and eastward of Khur Musa, are many banks, which dry in patches, with deep unexplored channels between them.

Khur Musa (Músa) trends northward from about 8 miles south-southwestward of Daira Island; it receives the waters of Khur Dorak and probably a branch of the Karun. There is a least depth of 2½ fathoms on the bar of the khur.

About 13 miles north-northwestward of Daira is Kabr an Nakhuda, a low islet from which the eastern bank of the khur extends southward 23 miles, and partly dries. Kaseir bint Sisuan (Kassar bin Siswan) (lat. 30° 13′, long. 48° 59′), in the middle of the khur 5 miles southward of Kabr an Nakhuda, is a rocky shoal about 1¼ miles long north and south, with less than 6 feet water; it is steep-to, and can be passed on either side.

Bu Suf, a white sand islet with a cairn, 7 feet high, lies about 4 miles west-northwestward of Kabr an Nakhuda. Khur Bukhader (Abu Khadhair), the banks of which are steep-to, trends westward from about 2 miles westward of Bu Suf, and probably joins Karun River. About 14 miles farther northeastward, Khur Dorak trends west-northwestward and is somewhat tortuous in its lower reaches; it afterwards takes a general northerly direction.

Khur Musa continues about 6 miles east-northeastward from its junction with Khur Dorak, and thence as Khur Mashur (Ma'shur) trends north-northeastward some 7 miles.

There are no signs of habitation anywhere up the khur, the land is generally low and swampy, and no provisions are obtainable.

Directions.—The passage up Khur Musa presents no difficulty, but the bar should be buoyed. Enter the khur at low water, with the sun astern, when the banks are most clearly seen. Should the water shoal, it is well to anchor, and send boats to sound and find the channel. Keep the eastern bank aboard, the course being about 348°; sometimes the position of the sun renders it advisable to keep the western bank aboard. When Kabr an Nakhuda (lat. 30° 18′, long. 49° 00′) bears about 70°, steer about 312°, and anchor when Bu Suf bears 95°, about 1½ miles.

Khur Bukhader can be ascended some 5 miles above the anchorage just mentioned by keeping in mid-channel; farther up the channel becomes too narrow for a vessel of any length to turn. In Khur Musa, above Bu Suf, keep on the western side, steering about 356° for 2½ miles, when the khur turns first northeastward and then eastward. A British naval vessel in leaving the khur in 1910 lost the channel several times in the southern 4 miles, owing to the banks not showing, and a southeasterly course had to be maintained for 4 miles outside the bar before it was possible to steer toward the entrance of the Shatt al Arab.

Daurakistan (Dorakistan), westward of Khur Musa, is a low swampy tract intersected by creeks, extending to Khur Bahmishir, a distance of about 18 miles; Bu Seif (Sif) is its southeastern point.

Khur Silaik Bahri, close westward of Bu Seif, has about 6 feet water in the entrance, and is said to join Karun River.

Khur Silij (Kuwairin), about 8 miles westward of Bu Seif, also joins Karun River; neither of these khurs has been explored for any distance.

Shatt al Arab—Approach.—Maidan Ali is the great shallow flat lying on the eastern side of the approach to Shatt al Arab; the southern 3-fathom edge of the flat from about 10 miles southeastward of Bu Seif trends west-southwestward about 17 miles, and the depths over the flat are generally regular, the lines of equal depth being probably nearly parallel to the shore. The bottom is mud and sand, the latter predominating as the shore is approached. The western side of Maidan Ali borders the Khur al Amaya, and soundings on its outer point may be useful in making the Shatt al Arab as well as Khur al Amaya in thick weather.

Caution.—Off the entrance to the Shatt al Arab, and for some distance to the southward, experience has shown that forenoon observations of the sun may sometimes give a position from 2 to 4 miles to the eastward and afternoon observations a position from 2 to 4 miles to the westward of the true position. This appears to be caused by abnormal refraction arising from the unequal temperatures of the salt and fresh water streams and hot winds from the desert.

Banks.—For about 20 miles southeastward and southward and 15 miles southwestward of Maidan Ali the soundings are very uneven and afford little guide to navigation. Banks, with depths of from 4½ to 9 fathoms, trend generally northwest and southeast, and the water is deep between them.

Shoals.—There is a patch with 4¼ fathoms water, 22 miles, 151° from Bu Seif, and there are 4½-fathom patches 5 and 7 miles northeastward of this patch.

A shoal of small extent, with 3 fathoms water, lies about 15 miles southward of Bu Seif, and there are depths of less than 5 fathoms for 2 miles southeastward and northwestward from it.

Palinurus shoal, 2 miles long north and south, and 1 mile broad, with 3 fathoms least water, sand bottom, lies about 24 miles 199° from Bu Seif.

Khur al Amaya (lat. 29° 52′, long. 48° 46′), on the western side of Maidan Ali, leads into Bahmanishir River. The khur is not marked in any way, as the banks do not dry until well inside the bar. The soundings decrease from 9 fathoms in the entrance to 3 and 1¼ fathoms northeastward of Marakat Abadan.

The khur was formerly the eastern channel into the Shatt al Arab, but the passage into that river has silted up. Vessels of 7 feet draft can enter Bahmanishir River at low water, the least depth to

be passed over being a bar with 1¼ fathoms, soft mud, 10 miles outside the mouth. Inside the bar the depths vary from 1½ to 2 fathoms.

Bahmanishir River (Bahmishir) is the mouth of Karun River, and its course is about 50 miles in length from the entrance, 10 miles above the bar, to Muhammera, or 35 miles in a straight line. The following description is mainly from an examination made in one day only, in 1890. The river appears to be navigable for vessels of not more than 7 feet draft for about 30 miles from its mouth. There are two sharp bends near the middle of its course, the first commencing 9 miles from the mouth. Its width near the mouth is from 3 to 4 cables, but in the northern half of the river, in some places, only 1½ cables. The banks near the mouth are sloping, and of soft mud, covered with a coarse grass above high-water mark; a few miles farther up the banks are harder and steeper. About 22 miles from the mouth villages and date gardens commence, and thence these line the banks almost all the way to the junction with the Karun. The northern part of the river for about 15 miles is very shallow and uneven, some of the mudbanks drying almost across the channel; so that a British naval vessel, of 3 feet draft, grounded twice in steaming up it.

Directions.—As there are no pilots for the Bahmanishir, a bagala man accustomed to the river should be obtained if possible. If obliged to do without local assistance, it is advisable to start with a rising tide; bring the Shatt al Arab lightvessel to bear about 168° astern and steer 348°; when the lightvessel is distant 6½ miles steer about 320°, which course leads into Khur al Amaya, using great caution, and if necessary anchoring and verifying position by sending a boat to sound. The reeds off Barr Nasar will probably be sighted ahead.

Having run 5 miles, 320°, allowing for the tidal current setting northwestward, alter course to 348° for 1 mile, passing over the bar, when steer 326°; on this course the reeds at the mouth of the river begin to show, a tall square clump marking the southern point of the entrance, which is left to the westward. When within the entrance, the deepest water is close to the bank of the concave side in each bend, crossing over at the commencement of each change in the bend.

These directions, which are taken from the plan, must be considered only a guide, and necessarily the courses will be different if the vessel does not follow the route here given.

Tides.—It is high water, full and change, in Khur al Amaya, at 11 h. 30 m.; springs rise 10 feet, neaps 7½ feet.

The velocity of the tidal currents in the khur is from 1 to 2 knots, and the currents continue about 45 minutes at springs and 25 min-

utes at neaps, after high and low water. The duration of slack water is about 20 minutes.

Shatt al Arab.—The united currents of the Tigris and Euphrates Rivers are known to the Arabs by this name. The Shatt al Arab is a fine river, navigable as far as Basra, a distance of 70 miles from the outer bar buoy, by any vessels that can cross the bar at the entrance, but at certain seasons of the year a bar forms in the river from about 600 to 1,800 yards below Hafar Channel entrance. The width of the river at the mouth abreast the Turkish fort (lat. 29° 57′, long. 48° 32′) is 1½ miles and the depth in the fairway there is about 3¼ fathoms, but the bars in the approach, which are subject to change, have a least depth of 1¾ fathoms. The land is very low on both sides of the entrance, but differs much in appearance, that on the western or Turkish side being fertile and thickly covered with date trees, while the eastern or Persian bank is comparatively bare and barren for several miles up the river; it is, however, being gradually brought under cultivation.

Khur al Kafka, the channel across broad flats, which form the bar, into the Shatt al Arab, lies between the two large banks Marakat Abadan and Marakat Abdalla, and is 13 miles in length from the Outer bar to abreast Ras al Bisha, the western entrance point of the river.

Banks.—Marakat Abadan, on the eastern side of the khur, is mostly hard sand and mud, with some patches of soft mud; it has from about 1 foot to 1 fathom water, but patches on its northwestern part dry at low water extraordinary springs. Fishing stakes can generally be seen on this part of the bank.

Tidal semaphore.—On the southern extremity of Marakat Abadan there is a white house on piles from which the actual depth of water in the track across the bar is shown by day and night.

A mast 54 feet in height, from which the signals are shown, stands on a platform 15 feet above low water. It has three arms, the upper of which indicates fathoms, the second feet, and the third inches, in the following manner:

Upper arm:

At an angle of 45° to the left indicates 1 fathom.
At an angle of 90° to the left indicates 2 fathoms.
At an angle of 135° to the left indicates 3 fathoms.
At an angle of 135° to the right indicates 4 fathoms.
At an angle of 90° to the right indicates 5 fathoms.
At an angle of 45° to the right indicates 6 fathoms.

Middle arm:

At an angle of 45° to the right indicates 1 foot.
At an angle of 90° to the right indicates 2 feet.

Middle arm—Continued.

At an angle of 135° to the right indicates 3 feet.

At an angle of 135° to the left indicates 4 feet.

At an angle of 90° to the left indicates 5 feet.

Lower arm:

At an angle of 45° to the left indicates 3 inches.

At an angle of 90° to the left indicates 6 inches.

At an angle of 135° to the left indicates 9 inches.

By night.—The following signals are hoisted on a bracket on the south side of the mast, 50 feet above the platform, the lights being 11 feet apart:

R R=12 feet. R	R=16 feet.	W=20 feet.
R W=13 feet. R	W R =17 feet.	W W=21 feet. W
R R=14 feet. W	W W=18 feet. R	W R=22 feet. W
R=15 feet. R	W W =19 feet.	W R=23 feet.

(*a*) One red over one white light—11feet.

(*b*) A green light exhibited below any of the other light signals denotes the immediate half foot and will be shown as long as there are 6 or more inches above the even foot.

Information with regard to tidal constants.—The following method of finding the time of high water at various places between the outer bar and Basra has been found to be approximately correct:

Time of high water at—

Outer Bar, time of high water Bushire, 4 hours.

Fao, time of high water Bushire, 5 hours.

Abada'n, time of high water Bushire, 6 hours.

Muhommera, time of high water Bushire, 7 hours.

Basra, time of high water Bushire, 8 hours.

In calculating time of high water from above only the higher tide of the day at Bushire should be used.

If a Shamal is blowing, about 50 minutes should be added to; and if a Kaus, about 15 minutes should be substracted from the above times.

For high water springs about one hour should be deducted, and for high water neaps about one hour should be added to the above times.

It has been found on an average that ships at anchor in the river between Fao and Basra swing to the flood stream about two hours before high water, and to the ebb stream about two hours after high water, except in summer, when ships rarely swing to the flood current.

NOTE.—Tidal predictions for Basra are published by the Survey of India. Tidal predictions for Shatt-al-Arab bar is published in a supplement to the British Admiralty Tide Tables, Part I, 1920.

Marakat Abdalla ('Abdullah), on the western side of the khur, is soft mud, and dries in patches at extraordinary spring tides for about 3 miles southeastward from Ras al Bisha; there are depths of from 1 foot to 1 fathom on the eastern part of the bank. Both banks, which extend about 12 miles southeastward of Ras al Bisha, slope rather gradually toward the khur, and consequently they are not indicated, except during kaus, when the sea breaks on the banks at intervals.

Depths.—The khur has general depths of from 2¼ to 3¾ fathoms water, the shoalest place being the Outer Bar, where there were 1¾ fathoms in 1911; the Inner bar, eastward of Ras al Bisha, had a least depth of 2¼ fathoms; above the Inner bar the water soon deepens to 3 and 3¼ fathoms.

The water at the outer bar is generally very discolored; the discolored water comes down with the tidal current, and is clearly marked; it is no guide as to the depth of water.

Kola Patch, on the western side of the outer bar, is hard sand, with a least depth of 4 feet; it is often marked when the wind opposes the current, and the sea breaks on it during kaus.

The banks at the entrance to the Shatt al Arab are liable to change.

Navigation.—Vessels of more than 11 feet draft must wait for the flood to cross the bar (lat. 29° 50′, long. 48° 43′). At high water springs, the highest tide being always the night tide in winter and the day tide in summer, vessels of about 20 feet draft can be navigated up the Shatt al Arab to Basra. Vessels of 15 feet draft may navigate the Shatt al Arab as far as Kurna (lat. 31° 00′, long. 47° 25′), at the junction of the Tigris and Euphrates, about 39 miles above Basra and 117 miles from the Light Vessel. From Kurma it is 421 miles to Baghdad by the Tigris River. Vessels of such draft can only do this with safety by crossing the bar on the top of high water of the highest tide of the 24 hours.

At neaps, the draft possible for this navigation is restricted to about 17 feet.

As the mud is very soft, powerful vessels are often forced through a foot or more of it. Inward bound vessels of more than 20 feet draft are generally lightened to the requisite draft by steam lighters outside the bar, and outward bound vessels complete their loading there to more than that draft.

Four steam lighters, with a total carrying capacity of 4,000 tons, are kept at Basra for the purpose of lightening or completing the loading of vessels outside the bar.

Lightvessel.—A lightvessel (lat. 29° 44′, long. 48° 48′), painted red, and marked "Shatt al Arab" in white letters on both sides, with one mast, is moored about 7 miles southeastward of Kola patch, and exhibits, at 32 feet above the sea, a white flashing light every 10 seconds, which should be seen from a distance of 10 miles.

The vessel is maintained by the Indian Government.

Pilot vessel.—A steam pilot vessel is usually to be found near the lightvessel.

During strong northwest gales the pilot vessel is shifted about 3 miles northward of the lightvessel.

Buoyage.—The amended positions and description of buoys in the Shatt al Arab River entrance are now as follows (1919), dredging completed 1917:

(*a*) The outer bar (Fairway) gas buoy, black and white in horizontal bands, exhibiting a flashing white light, is moored in 7 fathoms, low water ordinary spring tides, about 2.8 miles 141° from the tidal semaphore.

(*b*) The outer conical gas buoy, painted red (starboard hand buoy), exhibiting a flashing green light, is moored in 12 feet, low water ordinary springs, about 1.7 miles 139° from the tidal semaphore.

(*c*) The outer bar (middle) conical gas buoy, painted red (starboard hand buoy), exhibiting a flashing red light, is moored in 11 feet, low water ordinary springs, about 1,750 yards 269° from the tidal semaphore.

(*d*) Buoy No. 1, a can buoy painted black (port hand buoy), is moored in 10 feet, low water ordinary springs, 1.7 miles 157° from the tidal semaphore.

(*e*) Buoy No. 2, a red nun (starboard hand buoy), in 9 feet, low water ordinary springs, about 1,300 yards 172° from the tidal semaphore.

(*f*) Buoy No. 2, a black can (port hand buoy), in 9 feet, low water ordinary springs, about 1.14 miles 257° from the tidal semaphore.

(*g*) Buoy No. 3, a black can (port hand buoy), in 100 feet, low water ordinary springs, about 1.65 miles 287° from the tidal semaphore.

(*h*) Buoy No. 4, a black can (port hand buoy), in 13 feet, low water ordinary springs, about 2.4 miles 303° from the tidal semaphore.

(*i*) Buoy No. 5, a black can (port hand buoy), in 13 feet, low water ordinary springs, about 3.2 miles 310° from the tidal semaphore.

(*j*) Buoy No. 6, a black can (port hand buoy), in 13 feet, low water ordinary springs, about 4.1 miles 314° from the tidal semaphore.

(*k*) Inner conical gas buoy, painted black (port hand buoy), exhibiting a flashing green light, in 17 feet; low water ordinary springs, about 4.9 miles 317° from the tidal semaphore.

(*l*) Buoy No. 7, a black can (port hand buoy), in 13 feet, low water ordinary springs, about 8.4 miles 115° from Fao flagstaff.

(*m*) Buoy No. 8, a black can (port hand buoy), in 13 feet, low water ordinary springs, about 6.9 miles 113° from Fao flagstaff.

(*n*) Inner bar gas buoy, exhibiting a flashing white light, in 16 feet, low water ordinary springs, about 6.5 miles 109° 30′ from Fao flagstaff.

Approximate position of tidal semaphore: 29° 50′ 21″ N., 48° 42′ 58″ E.

Approximate position of Fao flagstaff: 29° 58′ 24″ N., 48° 28′ 57″ E.

Prohibited anchorage.—Anchorage is prohibited westward of a line drawn 126° from the fairway light buoy and westward of a line drawn 340° from the Shatt al Arab Lightvessel.

Wrecks.—A wreck, with mast and gaff showing (in January, 1919) lies 1.8 miles 92° from the Outer Bar Buoy; it is a danger to vessels taking anchorage eastward of the buoy.

The wreck of a dhow (submerged) lies about 3 miles eastward of Ras al Bisha.

Beacon.—A wooden mast, 50 feet high, stands on the north shore, 2¾ miles, 65°, from the Turkish Fort.

Directions—Inward.—From westward of Jezirat Kharag, steer direct for the Shatt al Arab Lightvessel, and thence to the Outer Bar Lightbuoy; in thick weather or when uncertain of the position, steer toward the Maidan Ali until in 5 fathoms water, when steer westward in that depth on the flat southward of it until the lightvessel, on Outer Bar Lightbuoy, is sighted. The soundings are very uneven for some 15 miles southeastward of the lightvessel, and from this direction they are not a good guide.

NOTE.—Until the channel has been rebuoyed, the dredging being completed, vessels should employ a pilot.

Outward.—When outward bound in a large steamer, wait at Fao (lat. 29° 58′, long. 48° 30′) until she swings to the flood, in order to be at the outer bar at high water; but swinging to the flood at Fao can not always be depended upon, as during spates, which occur in spring and early summer, there are times when there is little or no flood current. In this case a vessel might not swing at all, or only at high water, which would make her late on the bar.

A good guide is to note the rise of the tide by some mark on shore, and proceed by that.

From Fao, steer about 110°, or to midway between Inner bar and No. 9 buoys, and leave the black buoys on the starboard hand, and Old Bar Buoy on the port hand, at the distances given for entering.

Caution.—In consequence of the frequent changes in the channel, the directions just given must be followed with considerable caution, observing that the latest edition of the plan, owing to more recent changes, can not always be implicitly relied on.

Tides.—It is high water, full and change, on the outer bar of Khur al Kafka at 11 h. 30 m.; springs rise 10 feet, neaps 7½ feet, and it is high water, full and change, at the Persian fort (lat. 29° 59′, long. 48° 32′) at 11 h. 50 m.; springs rise 9 feet, neaps 6¾ feet, but both the time and rise are variable, depending chiefly on the wind and the state of the river. The tides appear to be somewhat irregular on the bar, a considerable rise taking place during the last 2 hours of the flood, and comparatively little during the first 4 hours, and a considerable fall taking place during the last 2 hours of the ebb and comparatively little during the first 4 hours; further observations are required to verify this.

In summer the day tides and in winter the night tides are much the higher. In winter the heights of the day and night high waters are more nearly equal at neaps, but differ from 3 to 4 feet at springs; the difference in the heights of the day and night low waters is greatest at neaps, being then from 4 to 4½ feet and at springs from 1½ to 3 feet. The highest tides occur in April and May; the lowest generally in October and November. Both height and time of tide are greatly affected by the prevailing winds. After a moderate shamal the water falls lower than at other times; on the other hand, the most water will be found during and for a short time after a continuance of southerly winds.

It is high water, full and change, at Fao at 0 h. 12 m.; springs rise 8½ to 9 feet, neaps 6 to 7 feet. During August and September at springs the day tides are the highest, but during neaps the night tides are the highest. During September, October, and November the lowest high water and the lowest low waters are experienced, the low waters occasionally falling below the datum of soundings and rising to 8 feet at neaps. During October, November, and December

the night tides are always the highest, and from January the day tides are highest.

Tidal currents.—Near the Outer Bar lightbuoy at springs the ebb current sets southeastward at a velocity of from 2 to 3 knots; at neaps from 1 to 1½ knots. The flood current sets northwestward, but is usually not so strong. The velocity of the currents during the last 2 hours is said to be nearly double that during the first 4 hours, but further information is required.

In the channel the currents follow the general direction of the banks; the velocity of the ebb varies from 2 to 3 knots at springs and from 1½ to 2 knots at neaps; the velocity of the flood varies from 1½ to 2½ knots at springs and from 1 to 1½ knots at neaps.

The flood current continues as an average 80 minutes after high water at springs and is irregular at neaps; the ebb current continues 30 minutes after low water at springs and 50 minutes at neaps; during a shamal slack water occurs nearly at high and low water. The duration of slack water varies from 15 to 30 minutes at springs.

Pilots, in vessels of suitable draft, are not entirely necessary. A British naval vessel and others have frequently proceeded from sea to Basra and the reverse without a pilot. In a vessel of much draft it is, however, advisable to have the services of a pilot.

Pilots for the river can generally be obtained at Abu Shahr (Bushire) and sometimes at Linga, and unless otherwise arranged at the time of hiring they expect to be landed on the return voyage at the place where hired.

Distance tables.—Persian Gulf to Baghdad.

SHATT-AL-ARAB AND TIGRIS RIVERS.

Place.	Miles.	Place.	Miles.
Shatt-al-Arab lightvessel	.....	Shatt-al-Arab lightvessel	.....
To outer bar	5	Filaifilah	260
Fao	22	Ali Gharbi	276
Abadan	48	Shaikh Saad	306
Mohammerah	60	Arab village (G. H. Q.)	319
Basra	78	Kut el Amarah	346
Gurmat Ali	83	Bghailah	389
Kurna	117	Azizayah	442
Ezra's tomb	144	El Kutineh	453
Aburuba	158	Baghdadiyah	462
Q'alat Salih	170	Lejj	490
Abu Sidra	185	Bustan	501
Amarah	199	Ctesiphon	508
Kamait	226	Diahah River	520
Ali Shargi	240	Baghdad	538

EUPHRATES RIVER.

Place.	Miles.
Kurna	.....
Medina	13
Chahbaish	27
Hakika	49
Suk-esh-Sheyukh	55
Nasiriyah	75
Samawa	140

KARUN RIVER.

Place.	Miles.
Mohammerah	.....
Marid	10
Ahwaz	110
Shustar	191

Fao (Fáo) (lat. 29° 58′, long. 48° 30′), 3½ miles above Ras al Bisha, is a village with a population of about 400, chiefly herdsmen and cultivators of the soil.

Light.—A fixed red light is exhibited at 25 feet above high water from a post near the telegraph offices at Fao, and should be seen from a distance of 6 miles.

Telegraph.—The British Persian Gulf telegraph cable (1864) terminates here, and the British and Turkish telegraph offices are situated in a brick building of two stories, near the river bank, and there are two very large dark trees close behind it; the British office is for cable messages, the other for the land line. Messages are received here from all parts by the Turkish office, but considerable difficulty is caused to their reception by the quarantine regulations in force.

Customs—Quarantine.—Fao has a Turkish customhouse and quarantine department. The quarantine regulations are peculiar and very irksome, no vessel, except as stated below, being allowed to communicate with Fao until she has been up the river to Basra and obtained pratique there. Telegrams for transmission can, however, be handed in at the quarantine station from a ship not having pratique, and the Turkish official in charge permits the officers of the British telegraph station to speak to the occupants of a boat at the landing, provided that they do so in his presence.

Naval vessels from Abu Shahr (Bushire), Katif, or Kuweit, can be given pratique by the Turkish quarantine officer at Fao. To obtain pratique, before any other communication is held with the shore, an officer, preferably the medical officer of the vessel, should communicate with the Turkish quarantine officer, and sign an "Interrogatoire" form, provided by the latter.

Naval vessels from India, which have been five days at sea, will be given pratique at Fao, after inspection and production of a medical certificate.

Basra steamers touch at Fao on their way to and from Basra.

Landing.—The best landing is in a small creek just above the telegraph office at Fao, with steps where small boats can land from 3 hours before until 3 hours after high water, but the creek nearly dries. A wooden jetty has been constructed between the telegraph office and the creek. There is also a rough jetty made of stones over the mud, a little below the lightpost; the quarantine ground is at the inner end of this jetty. There is deep water a few yards from the outer end.

Supplies.—Sheep, beef, fowls, eggs, and fruit can be obtained from the Persian shore opposite Fao. There are seven water tanks, each with a capacity of 400 gallons.

Communication.—The fast mail steamers of the British India Steam Navigation Co., to and from Bombay and Basra, call at Fao once a week.

Shatt al Arab—General description.—The land on the eastern side of the river southward of Hafar Channel is the long, narrow Jezirat al Khidr (Abadan ('Abadan) Island), which lies between the Shatt al Arab and the Bahmishir, and is Persian territory. The Shatt al Arab, from its mouth to within 16 miles of Basra, is the boundary between Turkey and Persia.

The banks of the river are very low on both sides to and beyond Basra, and are intersected by numerous canals for irrigation; the land is often under water, except small raised banks between the plantations. The belt of land near the river from Fao to a few miles above Kurna (lat. 31°, 00′, long. 47° 25′) is exceedingly fertile and produces very fine dates, also fruit and vegetables of various kinds, with grain, etc.

The date groves extend from ½ mile to 2 miles from the river bank; behind them all is a desert or swamp. There are many wild hogs and large herds of cattle and buffaloes along the banks of the river; the latter often swim across to graze on the islands. There is excellent duck and snipe shooting on the banks of the river, especially at Fao and above Basra; partridges also are plentiful.

Between the plantations of trees are sandy tracts of land along the banks; these are uncultivated, though probably as fertile as the rest. Supplies of fruit, vegetables, and cattle can often be obtained at villages while waiting tide.

On the ebb, the water is fresh and fit for drinking even at Fao, except in autumn; then the river is low and the water slightly brackish; 10 miles farther up it is at all times fresh.

When between the regular banks with vegetation, the eye is the chief guide for navigation. The appearance of the two banks at the entrance is very different, the Turkish side being thickly planted with dates, while the Persian side is comparatively bare until about 2 miles above Fao. Ras al Bisha has some small date trees on it, and the Turkish fort, on the bank about 1¾ miles to the northwestward, is 10 feet high, built of white stone, and conspicuous; the Persian fort, on the left bank, 2 miles, 352° from the Turkish fort, is also conspicuous and has a flagstaff. The seaward and lower part of the banks is thickly overgrown with reeds and coarse grass; the soil, being a soft alluvial mud, is so soft that it is almost impossible to land, and landing anywhere near the forts should not be attempted.

Fao to Kabda Point.—There are date trees on the right bank for about 2 miles above Fao, whence a large thick grove, with a small village near its southern end, and inside it the large fort and village

of Maamir (Ma'amir), continues some 5 miles. For about 2 miles northwestward of this grove the bank is without trees and closely intersected by irrigation creeks. Ad Dura (Daurah) date grove, in which is a small village of the same name, then commences; at its southern end is a kiln, which is conspicuous from the southward, but obscured from the northward; the grove apparently merges northward in the long series of groves and villages of Dawasir.

Kabda Point (lat. 30° 11′, long. 48° 25′) is the long rounded projection of the right bank some 3½ miles northeastward of the kiln.

On the left bank opposite Fao are some herdsmen's huts and a few round trees; a boat creek leads into Bahmishir River. A little farther up begins a large date grove, with Kasba Village; the grove continues 3½ miles, and at its northern end is a square fort. The bank northward of the fort is very low, with small bushes for about 2 miles; then Manyuhi date trees commence and extend northwestward along the bank nearly to Chellabi Point, where there is a small mound; the point is just above the kiln on the opposite side. There are no trees on the left bank for many miles above Chellabi Point. Behind the Manyuhi trees is a fort and tomb, and 2½ miles above Chellabi Point is a group of huts, surrounded and almost hidden by date trees.

No detailed directions are given for navigating the river, the plan being a sufficient guide, observing that the deeper water lies generally towards the concave side. Shoal water extends from 600 to 1200 yards off the right bank from 1¾ miles northwestward of Fao to about 1 mile northward of Maamir, and 600 yards around Kabda Point. Shoal water also extends 400 yards from the left bank along Kasba date grove and 800 yards, or more than half way across the river, from about 1½ miles northward of these trees nearly to Chellabi Point; a large portion of this shoal dries and for upwards of 1 mile in length it barely covers and is an island.

From Fao, keep rather toward the right bank for about 1 mile, and then steer to pass about 600 yards off Kasba Point, and keep about 400 to 600 yards off the left bank until a little above the small square fort on that side; then gradually cross over to the right bank about 2 miles northward of Maamir, and keep near that bank past the irrigation creeks and almost up to the kiln, when gradually turn toward the left bank above Chellabi Point; when past Kabda Point shoal, with the northeastern extremity of Kabda Point bearing about 320°, return to the right bank.

Kabda Point to Al Khast.—Kabda reach of the river from Kabda Point (lat. 30° 11′, long. 48° 25′) trends northwestward about 11 miles to Abadan anchorage, and all along its right bank

are the villages of Dawasir and date trees. The right bank appears to be fairly steep-to until about 2 miles below Abadan anchorage, when fishing stakes and mud banks extend about 300 yards off it.

A string of islands and shoals extends from about 600 yards northeastward of Kabda Point 7½ miles along the left bank of this reach to abreast the southeastern part of shateit village; they are known by the name, apparently common to all, of Dawasir Island. The southeastern of the shoals dries half a mile from the southeastern island, and has less than 2 fathoms for 1,400 yards farther; the shoal at the northwestern end of the islands appears to be extending outward. Parts of the islands are cultivated, and there are 3 fathoms water close to their western sides.

The left bank is almost treeless, except a conspicuous clump at a ruined village within the southern part of the main Dawasir Island, northeastward of which are two tombs. There is a large date plantation at Shateit, and a smaller one at Bawarda, 2½ miles farther northwestward.

In Kabda reach keep the right bank abord, voiding the southeastern extreme of the Dawasir Island shoals, and, when past Shateit village, gradually close and keep on the left bank to Abadan anchorage.

Abadan Anchorage ('Abádán) is about ¾ mile above Bawarda, and on the left bank of the river here is the oil refinery of the Anglo-Persian Oil Co. (Ltd.), the oil being brought by pipe-line from the oil fields at Masjid-es-Suleiman, about 140 miles north-northeastward. There are many large buildings at the refinery, and the tall chimneys are conspicuous. The 5-fathom curve is about 100 yards off the left bank and ¼ mile off the right bank, the channel between, with from 6 to 10 fathoms water, being about 250 yards wide.

There is a pier at the refinery, and steamers secure alongside in 21 feet water. A red fixed light is exhibited at each outer end of the pier.

Three buoys are moored southeastward of the pier; the southeastern buoy carries a white fixed light, but the buoy cants over with the current, so the light is obscured by the buoy from a vessel going with the current until past it.

Northwestward of the pier a small black buoy marks the wreck of a lighter, about 100 yards off the bank.

It is advisable to anchor above the pier in order to be out of the way of vessels going alongside it.

Tides and tidal currents.—The tidal rise at Abadan is about 8 feet at springs. The flood current attains a velocity of 1½ knots, and the ebb a velocity of 3 knots.

Cable.—A cable having been laid across the river from the entrance to the western Boundary nullah, anchorage is prohibited in its neighborhood.

Prohibited anchorage.—Vessels are cautioned not to anchor with the Turkish police station south of Dabba Island, bearing eastward of 180°, nor with the consulate flagstaff at Muhammera bearing between 25° and 50°, nor within ½ mile of the Muhammera shore.

Abadan Anchorage to Hafar Channel.—Al Khast Reach commences immediately above Abadan Anchorage and trends westward and west-southwestward about 3 miles; it then turns rather abruptly west-northwestward and north-northwestward nearly 6 miles to Hafar Channel entrance. Above Abadan and northward of Al Khast is Bareim (Baraim), a small village, where a shallow branch of the river, a mere boat passage, continues about 3 miles northwestward and rejoins the main stream at the large Harta (Harthah) Village. Muhalla Island is situated between the shallow branch and the main stream, and its southwestern part is very low; both banks of the boat passage are thickly covered with date groves.

Seihan (Zain) Village, with a fort and date grove, is situated on the right bank just above the curve westward of Al Khast, and there is a treeless area about 1 mile in extent on both sides of it where the telegraph poles can be seen; about 1½ miles above Seihan is a creek, with a customhouse on its northern side, running through the middle of a date grove. Thence the country is more open to Hafar Channel, telegraph poles are seen, the date trees scattered, and the land is variously cultivated. From about ¾ of a mile above the customhouse just mentioned to abreast Harta Village, the right bank is bordered by a series of mud islands, which mostly cover, and shoals, to the distance of nearly ½ mile.

From Abadan Anchorage keep the left bank of the river aboard and pass southward of the eastern end of Muhalla Island; then gradually cross and keep on the right bank till abreast the customhouse above mentioned, when proceed along the west coast of Muhalla Island, and pass close off Harta Village.

About 1,400 yards above Harta (lat. 30° 23′, long. 48° 12′) is a mud shoal with 2¼ fathoms water in mid-channel. This shoal, with other patches northward of it, appears to be a prolongation of the bar next described, and constantly shifts.

Bar.—From 400 to 1,600 yards southward of the entrance to Hafar channel the ship channel of Shatt al Arab is obstructed by a bar, over which a depth of 10 feet is charted in the fairway, but the depths appear to vary and there is sometimes a depth of 16 feet. About ½ mile south-southeastward of the Quarantine flagstaff and nearly in mid-channel are, at times, depths of from 4 to 6 feet, hard sand. This shoal forms periodically, and usually between February

and June. The least depth of water over it is when Karun river is in flood before the Tigris, and the greatest when the contrary is the case. Caution is necessary here, especially when steaming with the current.

The track above Harta (lat. 30° 23′, long. 48° 12′) appears to lie rather on the right bank, westward of the shoal parts of the bar, and in mid-channel past Hafar Channel entrance, ½ mile below which is the southeastern end of Dabba, a low grassy island about 4¼ miles long, with a shallow spit extending southeastward 700 yards from its southeastern end; the island, excepting its southeastern end, is thickly covered with date trees from 20 to 30 feet high. The western side of the British Consulate bearing 347° led eastward of the spit extending southeastward from Dabba in 1909, but this does not agree with the plan.

Hafar Channel to Basra.—From the Hafar Channel, Dabba Reach of the Shatt al Arab trends westward 13 miles; the river then trends northwestward about 4½ miles to the entrance to Ashar creek, some 3 miles up which is the town of Basra, both banks of the Shatt being lined with date groves the whole distance. On the right bank opposite Hafar Channel is Mutawa Village.

The water is deep at the entrance to Hafar Channel, off which the tidal current must be guarded against.

A good position for anchoring is with the palance and British consulate flagstaffs, on the northwestern side of the entrance to Hafar Channel, in 68° rather nearer the Muhammera Bank than Dabba Island.

There is a palace of the Shaikh of Muhammera at Fahliya (Failiyeh), on the left bank, 2¾ miles above Hafar Channel.

The ship channel varies from 400 to 600 yards in width between Dabba Island and the Persian shore of the Shatt al Arab to the northward; the deepest water follows round the concave shore, but passes close northward of the western end of Dabba, and southward of Sham shamiya, a small low island on which is a conspicuous white customhouse; a spit extends about 600 yards eastward from this island, but it is always wholly or partially visible. In 1909, the Shaikh of Muhammera's palace just open northward of Dabba Island led through the chanel at the western end of Dabba. From Sham shamiya the fairway is rather toward the right bank all the way to Basra, the left bank being two low, narrow islands, barely separated from each other, 11 miles long; the eastern island is named Toweyea (Tawailah), and the western one Quarantine (Ajerawiye) (Ajairawiyah); at the western end of the latter is a quarantine camp.

Wrecks.—A wreck lies nearly in mid-channel about 1¼ miles above the eastern end of Quarantine Island; and the wreck of a coal lighter was lying, in 1898, nearly in mid-channel, with the Quarantine flagstaff at the western end of the island bearing 40°, and anchorage should be avoided here.

Boundary.—Some 5 miles above Hafar Channel the Turkish-Persian boundary trends northward, and both banks of the Shatt al Arab become Turkish territory.

Al Basra (known as Basra), the chief port of the extensive districts of which Baghdad, in Turkey, and Kirmanshah, in Persia, are the commercial centers, is in Basra Reach of the Shatt al Arab, which trends north-northwestward from the western end of Quarantine Island (lat. 30° 31′, long. 47° 53′).

For about 2 miles northward from abreast the western end of Quarantine Island the left bank of Basra Reach is bordered by a drying mud bank which extends off 100 yards, and the 30-foot curve is distant nearly 250 yards, but the right bank is almost steep-to. The channel is from 250 to 300 yards wide between the 3-fathom curve.

Ships arriving at Basra will be berthed by a harbor master, under instructions from the port officer, who will come on board at Saraji, about 1½ miles below the old British consulate.

Anchorge.—There is anchorage in mid-channel in Basra Reach in from 34 to 48 feet. Vessels should moor with the anchors up and down the river, and plenty of cable on each, as the currents are strong; small local steam craft should be given a wide berth, as they usually lie at single anchor with a long scope of cable. It is better to moor near the right bank, as vessels almost invariably swing with their sterns toward the left bank. In the date season there are often 15 or more steamers moored in Basra Reach, when it is difficult to see where there is a vacant berth.

Tides and tidal currents.—It is high water, full and change, in Basra anchorage at 6 h. 0 m., or about 6½ hours later than at the outer bar; springs rise about 9 feet. The velocity of the ebb current varies from 3 to 6 knots, and that of the flood from 2 to 4 knots; the duration of the ebb current is about twice that of the flood.

Basra Town, on the right bank of the Shatt al Arab, and about 67 miles from the bar, is the seat of Government of the vilayet of Basra, which extends some 600 miles along the lower Euphrates and Tigris Rivers, and on the western side of the Persian Gulf southward to Ojar, opposite Bahrein; the vilayet includes the sandjaks of Amara, Basra, and Muntafik.

The walled town, some 3 miles up Ashar Creek (Nahr el Ashar), contains the bazaars and Turkish Government offices; outside the walls extensive suburbs, divided by gardens and date groves, line

both sides of the creek down to its mouth, and the river bank also both above and below the creek. A light wooden bridge crosses Ashar Creek about a mile from its mouth. The soil is rich and well cultivated, producing all kinds of fruits.

Southward of Ashar Creek is the Turkish arsenal or dockyard, the British consulate and flagstaff, the Turkish commodore's house, the offices of European merchants, and the United States Consulate. The French, Dutch, and Persian consulates stand on the Ashar. Northward of the creek are the customhouse, and the shaikh of Muhammera's palace, a conspicuous building with two towers. On the left bank of the river abreast Ashar Creek is Tanuma Hospital and flagstaff.

The population numbers about 40,000, mostly Arabs. There are some Europeans and Indians, about 3,000 Persians, and 1,000 Jews.

A naval depot is established at Basra.

A pier, 360 feet in length with a crosshead 120 feet by 20 feet, and a depth alongside of 6 feet at low river, is situated abreast Tanuma, Hospital. Light railroad lines are laid on it, and a crane is to be erected, to lift 5 tons. Buoys are moored near the pier, for the use of H. M. small craft. There is also a boat slip, and another pier, as charted.

Climate and health.—The prevalent northwesterly wind of summer is dry and hot. July, August, and September are intensely hot; December and January cold, often with frost; the rest of the year resembles the spring and summer of southern Europe. In the autumn months the nights are generally cool, and it does not get hot until about 10 h. a. m., the afternoons being intensely hot.

Outbreaks of bubonic plague occurred in 1910, and epidemics of cholera occurred in that year and in 1911. Malarial fever and ague are rather common. During June, when the run rises about 5 a. m., it is intensely hot by 8 a. m., and cool nights are the exception.

Quarantine.—Pratique must be obtained from the quarantine station, which is close to the Turkish commodore's house. Vessels from India arriving at Basra (lat. 30° 31′, long. 47° 52′) in good sanitary condition undergo as many days' quarantine as are necessary to complete a period of five days from the last Indian port, in addition to disinfection and destruction of rats; those arriving after having completed five days since leaving the last Indian port undergo a medical visit, disinfection, and destruction of rats, and receive pratique immediately after disinfection provided the medical visit is favorable. The above regulations apply only to vessels carrying a qualified doctor; others undergo a supplementary quarantine of 24 hours, in addition.

Destruction of rats does not delay the grant of free pratique, as this operation may be effected during or after quarantine, but no

fresh cargo can be put on board until it has been performed. There are also regulations for vessels carrying pilgrims.

The quarantine regulations are strictly carried out.

Communication.—In normal times the vessels of the British India Steam Navigation Co.'s fast mail service between Bombay and Basra leave Bombay weekly on Thursday and arrive at Basra on the following Thursday, but arrival may be later if unable to cross the bar in time to proceed up the river, and the vessels may be detained at Kurachi to await arrival of outward English mails from Bombay; the vessels of this service leave Basra on Saturdays. The vessels of the subsidiary mail service leave Bombay weekly on Thursday and reach Basra in 14 or 15 days; these leave Basra weekly on Monday or Tuesday and arrive at Bombay in about 12 days. Steamers of the Anglo-Algerian Steamship Co. (Ltd.), Ellerman & Bucknall Steamship Co. (Ltd.), and West Hartlepool Steamship Co. (Ltd.), from Europe; and Bombay-Persia Steam Navigation Co., Arab Steamers (Ltd.), Haji Sultan Ali Shustari Line, from Bombay, also proceed to Basra.

Telegraph.—The Turkish telegraph office receives messages for all parts of the world, but there are delays at times owing to the line being constantly broken, and the office is always closed at midnight. There is no connection by telegraph between Basra and Muhammera.

Supplies.—Meat, bread, vegetables, and fruit can be procured; the prices vary. Basra (lat. 30° 31′, long. 47° 52′) is the best place in the Persian Gulf for obtaining fresh provisions. The river water should be used for washing purposes only. A very limited supply of stores may be had occasionally.

Coal is obtainable; in normal times the quantity in stock was usually from 1,600 to 2,300 tons, some 5,300 tons being imported annually. There are three coal wharves, 200 feet, 410 feet, and 500 feet in length; depth alongside not known, but the coal is brought to vessels in lighters.

Repairs.—Small repairs can be effected at the arsenal. Small castings can be made, though there is no proper foundry. In the machine shop there are three lathes, a punching machine, and some others; the largest lathe can turn a shaft 6 feet long by 8 inches in diameter.

Railroads.—From Basra a railroad runs through Kornah to Amarah, following the general direction of the Tigris, and from Kut to Baghdad there is a branch connected with the great general system running into Europe via Mosul, Aleppo, and Adana, but it is not at present in contemplation to join up Amarah and Kut, as the main Baghdad line is intended to follow the course of the Euphrates.

Trade.—Basra is the trade gate of Mesopotamia, and also at present of a portion of western Persia; a considerable trade is carried on with India.

In 1912 the exports consisted chiefly of dates, barley, wheat, gall-nuts, seeds, opium, horses, hides, ghi, carpets, wool, etc. In the same year the imports were chiefly cotton and wool cloths, coal, gunnies, tobacco, sugar, coffee, copper, iron, petroleum, provisions, spices, stationery, wood for date boxes, planks, yarn, and twist.

Currency.—The coins current in Basra are the Turkish lira (£T) of 100 gold piastres, or 108 silver piastres,=18s. 2d.; majidi (M) =3s 4d.; rupee=1s. 4d.; Persian kran=4d.; metallic=½d.

Weights.—Dry measure, for grain, butter, wool, skins: 1 oke=2.83 pounds; 2½ okes=1 hojiya (7.075 pounds); 24 hojiyas= 1 maund (169.68 pounds); 20 maunds=1 tagar (3,394) pounds.

Avoirdupois for meat, provisions, groceries: 400 dirhems=1 oke (2.83 pounds); 2½ okes=1 hojiya (7.075 pounds); 4 hojiyas=1 maund (28.3 pounds).

Measures for dates: 54 okes=one maund (152.82 pounds); 40 maunds=1 large kara (6,113 pounds); 20 maunds=1 small kara (3,056.5 pounds).

Customhouse measure: 312 dirhems=one oke "ashari" (2.2 pounds).

Land or surface measure: 1 dra=19 inches; 6½ dras=1 gusba (10 feet 3½ inches).

MacGill (Magil), the native name of which is Kut al Farangi, on the right bank about 4 miles above Basra, has a repairing yard belonging to Messrs. Lynch, where fairly extensive repairs can be executed.

Basra reach may be said to end at MacGill, which is sometimes visited by Government vessels, but previous permission must be obtained from the Turkish authorities. Anchor near the left bank to avoid the strength of the stream.

A depot for material has been formed here by the Baghdad Railroad Co., and a substantial jetty built, with two carrying cranes capable of lifting heavy weights. The depth alongside the jetty is 9 fathoms. Additional jetties have recently been built, all of which can accommodate ocean-going steamers. There is also a mud dock for shallow-draft steamers.

Wharves.—A permanent structure of teak, 1,000 yards in length, capable of accommodating six large steamers, has been built at MacGill (Makil); it is fitted with 11 electric gantry cranes, and is served by the railway. There is a depth of 30 feet at low water.

At lower MacGill there is wharfage accommodation for two vessels. There are also six berths for river steamers.

Repairs.—There is a complete engineers' yard and store depot at MacGill.

Warehouses are being completed at MacGill, which will shortly be available for housing cargo, in bond or otherwise; they can be rented by importers.

Basra to Kurna.—Basra Reach may be said to end at MacGill, where the water is deep and both banks steep-to. See distance table.

From MacGill the river trends to the northwestward, and for 2½ miles is divided by two long low islands; vessels should take the northeast channel.

Abreast the gap between the two islands the New Euphrates River, or Kurmat Ali, flows in from the westward. This river is deep for the first few miles, after which it is split up by many islands, and becomes a shallow lake or swamp. Telegraph wires cross the entrance at a height of about 70 feet.

The west bank of the Shatt al Arab, both above and below the New Euphrates, is lined with conspicuous brick kilns.

The river thence leads nearly north for about 7 miles. The Katiaban Canal flows in on the eastern bank, and is said to connect with the Karun River. The east bank of the river from Basra to this point is lined with date groves; north of the canal is an open sandy desert.

The west bank has a thin fringe of date palms, beyond which is desert, which is sometimes flooded.

At 2 miles north of the canal the river turns to the northwestward, with general depths of 4 fathoms near the north bank; near the south bank it is shoal for the first 2 miles, after which it is steep-to, with deep water close to a prominent point, after which vessels should keep to that side of the river.

For 17 miles there is no difficulty in the navigation. Ash-shafi Creek, with five brick kilns at its entrance, is conspicuous on the west bank, which northward of this is open plain.

For about a mile northward of Ash-shafi Creek the river is shallow, with a depth of 2 fathoms at low river, but soon deepens again to 3 and 3½ fathoms. The river then narrows somewhat, and curves round to the northward and north-northeastward, the west bank, which is thickly planted with date palms, being steep-to with 4 fathoms of water close alongside.

Shaib Canal flows in on the east bank, where the river is narrowest; it is a deep river, which trends off to the northeastward and northward, with many turns, and with depths of 2 to 3 fathoms for the first 12 miles, but it is too narrow for anything larger than a steam launch. After passing the entrance to the Shaib Canal the main river bends round to the northwestward, and widens out into a broad reach 2½ miles long, most of which, however, is shallow, forming the bar of the combined Tigris and Euphrates Rivers. The

deepest water is close along the north shore, the channel being, however, very narrow, with a depth of only 8½ feet at high water and low river.

After passing the bar the river narrows again and becomes deep. there being 6 fathoms at the junction of the rivers.

Between Basra and Kurna the bottom is everywhere mud.

Kurna (Kurnah) is situated on the right bank of the Tigris, at its junction with the Euphrates. It is a place of about 700 houses and has a telegraph office. See distance table.

Tigris River is narrow and difficult of navigation on account of its numerous curves. The depths are from 2 to 4 fathoms for the first 10 miles above Kurna, but the current is swift. The river is nowhere wide enough to turn around in.

From Kurna to Amarah, a distance of about 90 miles, is the most difficult part of the river; vessels have to be handled with great care, and are constantly delayed. The general depth is about 13 feet at high river and 6 feet at low.

Amarah, on the east bank, contains about 1,500 houses, the population consisting of settled Arabs, with some Persians and Sabians. Wheat and barley are exported, and there is usually a small supply of coal.

From Amarah to Kut-al-Amarah, navigation presents no difficulty to vessels of suitable draft. The width is generally about 300 yards, with a depth of 26 feet at high river, and 6 feet at low.

At Kut-al-Amarah, the Hai branch, the ancient Tigris, leaves the right bank of the river.

From Kut-at-Amarah to Baghdad, a distance of 215 miles, navigation is rarely interrupted, though there are many shoals. The width of the river is generally from 300 to 400 yards, with a depth of 26 feet at high, and 6 at low, river.

Above Baghdad navigation is usually only by rafts, though small steamers can ascend to Samarra.

Kurna to Ezra's tomb (27 miles): The river between Kurna and Ezra's tomb is marked by black posts on the right bank and white poles on the left, to denote the course of the river when the banks are covered during floods.

The river between Kurna and Ezra's tomb is always good, but there are some bad bends, the worst being at Humaiyan, Saiifah, and the southern bend of Majrum reach. The traffic in the narrows is worked with regard to the fact that the movements of downward-bound vessels are controlled by the various signal stations, so that upward-bound vessels must conform to those movements, and such vessels must "bank in," if necessary, to allow downward-bound vessels to pass, and for this purpose certain places have been selected as "banking-in" stations, where upgoing vessels must stop; these

stations are marked by mooring posts painted with black and white horizontal stripes.

Ezra's tomb to Kalat Saleh (26 miles): The section Gumaija Shargi to Abu Ruba is the worst part of The Narrows. In the low-water season this reach is extremely difficult, owing to the narrow and tortuous course of the channel combined with the very strong current.

Great care must be taken to avoid grounding on the spits which run out for a considerable distance at the worst bends. From Abu Ruba to Kalat Saleh, with the exception of Jufakh reach, the river is good though narrow.

Kalat Saleh to Amarah (29 miles): The above-mentioned channels between Kalat Saleh and Amarah deprives the Tigris of a large amount of water, which causes the river to narrow to a width of about 60 or 70 yards below Kalat Saleh, forming that section of the river referred to above as The Narrows, that is to say, the Chahala Canal on the left bank of the river at Amarah; the Majar Kabir Canal, 2 miles above Abu Sidra, on the right bank; the Michriyah Canal, now partly dammed, a mile above Kalat Saleh, on the left bank.

The worst reach in the Kalat Saleh-Amarah section is the Muzaniyah reach, about 4 miles above Kalat Saleh; with the exception of this reach the river is generally good the whole year.

The Narrows control signal stations are situated at the upper end of Muzaniyah reach and at the Michriyah Canal; there are stakes also at these places for "banking in" purposes.

Amarah to Ali Gharbi (77 miles): Between Amarah and Sadiyah or Sayid Canal good water is found all the year round. From the canal to Ali Gharbi there is good water nearly all the year round, but soundings should be taken continuously in this section.

Ali Gharbi to Sheikh Saad (30 miles): During the low-water season there are three bad reaches in this section, viz., Said Abbas, Mandaliyah, and Abu Dud. The channels in these reaches are very liable to change; it is advisable to keep a careful record of the soundings for reference.

As vessels approaching the sharp bend at the bottom of Mandaliyah reach are unable to see one another, a good lookout should be kept on the signal station there, to ascertain if the channel is clear or not.

Sheikh Saad to Kut Camp (36 miles): Between Sheikh Saad and Kut Camp the river is good for navigation all the year round, and with care no difficulties should be experienced.

General: Rises in the river are caused by rain and melting snow.

"Rain-rises" as a rule commence about the middle of November; the first rises invariably fall very rapidly—a fall of 5 feet during

a night has often been experienced in the upper reaches, but by the end of December the river is usually full. After the second "rain-rise" the river continues good during the remainder of the winter months.

"Snow rises" start early in March, and by the end of that month or early in April the river is in full flood; about the middle of April rises from this cause cease, but a rise may occur owing to late rains. In May the river commences to fall, and great care must be taken in navigating it, as channels are not then formed; when the scour of the river has formed the channels, navigation becomes easier.

In June there is good water, but the channels must be carefully kept; in July the channels are apt to be most erratic; in August the channels begin to form; in September the river reaches its lowest level, and during this month trading steamers have made their worst passages; in October, at the first snap of cold or cooler weather, the sand banks appear to harden and the channels scour out several inches deeper.

Navigation in the Tigris varies with each season of the year, and as each year in itself varies, no hard and fast rules can be laid down.

In a good or favorable year the "rain rises" come regularly, and though the water may fall slightly the river is always gaining.

In bad years, the river perhaps falling later, a very high rise—anything up to 12 feet at Baghdad—may come any time in December or January; occasionally the river falls almost to its lowest (summer) level.

During low water occasional groundings are almost impossible to avoid, and local pilots are employed.

Suitable ships, of not more than 4 feet draft with independent engines, having steam capstans forward and aft and good ground gear, can navigate the Tigris from Al Basra to Baghdad at all seasons of the year.

Speaking generally, the best water is found on the outside of curves, but this is not invariably the case.

As the water in the river falls the channels often change, so that in certain sections local pilots should be engaged. Pilots can usually be got at Basra, Amarah, Ali Gharbi, Kut, Baghailah, Aziziyah, and Baghdad.

The nature of the river bottom between Basra and Baghdad is mud, and no rocks are found between these places. Ships taking the ground can usually haul off by laying out anchors.

The tendency of the current is to quickly wash away the mud on the upstream side of a ship, and to form a bank on the other, which sometimes rises above the water in three or four hours.

Baghdad, 460 miles above Basra, is built on both sides of the Tigris. A boat bridge of 40 pontoons crosses the river at Kazarah, a

short distance below Baghdad. The population is about 140,000, and supplies are plentiful.

Euphrates River.—The difference between the Euphrates and the Tigris is very marked; whereas the latter has a 3 to 4 knot current the Euphrates has little, if any. The difference in appearance is also very marked at Kurna, the Tigris water being muddy and chocolate in color, and the Euphrates very dark and comparatively clear. The Tigris water is said, however, to be the more wholesome of the two. See distance table.

From Kurna the river trends west-southwestward, and has a 2-fathom patch a short way up, but soon deepens to 3 or 4 fathoms, and for the first 20 miles has no difficulty for a vessel drawing 12 feet. About 7 miles from Kurna there is a great U-shaped bend, which, however, is not sharp, and the concave side is always deep.

After 20 miles the water gradually shoals until 2 fathoms is reached, at about 2½ miles below the large village of Chahbish. The water further shoals to 9 feet before reaching the village, the deepest water being close to the north bank. At the village itself there is from 12 to 18 feet. Shallow-draft vessels drawing 4 feet can reach the entrance of the Hamar Lake, about 6 miles above Chahbish, but the depth of the lake is only from 2 to 3 feet. The bottom is everywhere very soft mud.

River traffic.—In 1912 the traffic between Basra and Baghdad was maintained by steamers of the Idarah Nahriyah, or Turkish Government river administration, three belonging to the Euphrates and Tigris Steam Navigation Co. (Messrs. Lynch), which leave Basra every Saturday for Baghdad, and three of the Arab Steamship Co.

The vessels were of the American river type with disconnecting engines, the largest being 230 feet long and 45 feet across the paddle boxes, in 1906, and towing barges alongside, each could convey from 340 to 400 tons of cargo in the high-river season and about 280 tons in the low-river season. The steamers reach Baghdad in five days and return in four days, and maintain the connection between Baghdad and the Indian mail steamers. Three small stern-wheel steamers belonging to a native company (Agha Ja' far's) also ply on the river between Basra and Baghdad. A good deal of grain and certain bulky goods are carried by river sailing craft.

Native boats of about 30 tons, with 15 hands, take from 30 to 40 days in tracking to Baghdad.

Hafar Channel, generally called the Karun, leads eastward from the Shatt al Arab, 40 miles above Fao, into Karun River. It is about 400 yards wide, 2 miles in length, and has from 3 to 4 fathoms water; both banks are lined with date trees.

Muhammera (lat. 30° 26′, long. 48° 11′), on the northern side of Hafar Channel, about 1 mile within its entrance, is a town of rapidly growing importance, owing partly to the Anglo-Persian Oil Co. (Ltd.) having established its offices there, and it has a population of about 12,000; it has a bazaar, and is said to be comparatively cool and healthy.

The town is under the Shaikh of Muhammera, who, under the sovereignty of the Persian Government, controls the country eastward of the river to the Hindiyan district, and northward to 30 miles above Ahwaz.

The British consulate is on the northwestern point of Hafar Channel entrance, and there is an old palace, with a flagstaff, now the customhouse, about 200 yards westward of the consulate.

Vessels lie off the town close to the bank, but there is no room to swing, and they generally anchor in the Shatt al Arab just above its junction with the Hafar Channel; a vessel anchored at the junction continually yaws from the effect of the currents from the two rivers, and the holding ground is not good there. There is said to be a good berth in Hafar Channel just above the consulate and eastward of a permanent hulk, but it is not recommended for a short stay, as it is difficult to get out of the channel unless swung to the flood.

It appears to be high water at Muhammera about 6 hours after high water on the outer bar.

There is a wharf on the southern side of the northwestern entrance point of the channel.

There are disused barracks and a Persian quarantine station on the southeastern point of the entrance, opposite the British Consulate.

Trade.—The principal imports are matches, wood, rice, sugar, tea, drugs, kerosene, mineral products, textile products, wool, jute, mercery, hardware, and pottery, including tiles and bricks, and the exports are wheat, barley, almonds, dates, gums, cotton, wool, opium, and tobacco.

The currency consists of Turkish pounds, rupees, and krans.

Shipping.—Steamers of the Anglo-Algerian Steamship Co. (Ltd.), Ellerman & Bucknall Steamship Co. (Ltd.), West Hartlepool Steam Navigation Co. (Ltd.), from Europe, and of the British India Steam Navigation Co. (Ltd.), Bombay-Persia Steam Navigation Co., and Arab Steamers (Ltd.), from Bombay, call at Muhammera.

Communication.—The vessels of the British India Steam Navigation Co.'s fast and subsidiary mail services between Bombay and Basra each call weekly at Muhammera on their passages up and down the Shatt al Arab. There is a launch service between Basra and Muhammera.

A large number of native and Indian dhows, of from 80 to 120 tons, visit Muhammera in the date season (September–October).

Port and telegraph.—There are Indian and Persian post offices and a telegraph office at Muhammera.

Language.—The Persian language is spoken at Muhammera concurrently with Arabic.

Supplies.—Meat is fairly plentiful, but the supply of vegetables varies, and there is no bread. Supplies can be obtained at the bazaar. The mouth of the Hafar is a good place at which to take in water, as it is purer and cooler than that of the Shatt al Arab; in summer, a difference of 16° has been found in the temperature of the two streams.

Coal.—Messrs Strick, Scott & Co. stock a certain quantity of coal for sale at Muhammera; some 30 tons might be obtained from Basra with notice beforehand. It is sent off in lighters. The coal wharf is about 300 feet in length, but its whole frontage dries.

Karun River (Kárún) trends northeastward from the eastern end of Hafar Channel, whence (lat. 30° 27′, long. 48° 13′) the Bahmishir, into which the Karun flows, runs southeastward to the sea; but the main volume of water from the Karun flows through the Hafar into the Shatt al Arab. From Muhammera to Ahwaz, a distance of 117 miles, the course of the river is tortuous between low banks, through an almost desert country, but abounding with a great variety of wild fowl. The first vegetation is above Reuben's tomb, 16 miles north-northeastward of Muhammera, when the banks become fringed with light scrub, the country being extensive plains.

Navigability.—The Karun is navigable by river steamers of 2 feet draft at any time and of 5 feet draft when the river is high, but this does not agree with the 22-foot rise of river mentioned below, though it may be accounted for by the tortuous channel, etc. The river is from 400 to 1,000 yards wide, and the channel is very narrow in places, especially at the bends, where, as usual, the deepest water is generally on the concave side. Sand banks extend from most of the points, sometimes half way across. As far as Kut ab (ad) Doola ('Abdullah), a village on the southeastern side of the river, 7½ miles below Ahwaz, the bottom is mostly sand, or sand and mud, and free from rocks. Vessels of 12 feet draft reach Samana Bend, 14 miles above Muhammera; but, off the point there, the channel is narrow and the bend very sharp.

The river is said to rise 22 feet about January; the velocity of the current in a high river is from 4 to 6 knots, and in a low river about 2 knots. There is least water from August to October, inclusive, when for 20 miles below Ahwaz the navigation is difficult for a

steamer of 3½ feet draft. The tide is felt as far as Ali-bin-Husein's (Husain's) tomb, 30 miles above the entrance.

Farsiat Village is on the southeastern bank, about 65 miles above the entrance; at 2 miles below it, and projecting about 30 feet from the opposite side of the river, is a rock, covered at high river. Off Kut ab Doola are rocks, probably the remains of old buildings, with about 3 feet water. From this village to Bandar Nasri the river is much encumbered with sand banks and subject to constantly changing channels. From Bandar Nasri to Ahwaz, a little more than 1 mile, there is a great rise in the river bed and a series of heavy unnavigable rapids, followed by a navigable stream above the rapids. Off Bandar Nasri is a small natural basin, where vessels unload, and goods for transhipment to the upper waters are conveyed thither by tram.

Ahwaz (Ahwáz) (lat. 31° 28′, long. 48° 43′) is a modern town with, including Bandar Nasri (Nasiri), a population of about 4,000. and is the center of the grain district; it is reported to be 200 feet above the sea.

A range of hills, about 220 feet above the surrounding plain, marks the position of Ahwaz; three small peaks lie close together, and the highest, 420 feet above the sea, is about 2 miles southeastward of the town.

Ahwaz to Shushtar.—The river above the rapids is sinuous, from 200 to 300 yards wide, and flows between banks from 15 to 20 feet high, which gradually becomes steeper near Band-i-Kir, about 36 miles above Ahwaz; this place can be reached by shallow-draft river steamers. The country on each side of the river is extensive plains.

The bottom is rocky from Ahwaz to Grana reach; above that it is sand or sand and mud. Wais is a large village about 26½ miles above Ahwaz, at the southern end of a long reach. At Band-i-Kir the river divides into three branches, named Ab-i-Gargar (Gargar River), Ab-i-Shatait (Shatait River), and Ab-i-Diz (Diz River).

At Band-i-Kir vessels bound for Shushtar enter the Ab-i-Gargar, the eastern branch, for although the Ab-i-Shatait, the middle branch, also leads to Shushtar, it is completely barred about 1 mile above Band-i-Kir by a ridge of rocks, which renders it impassable to a steam vessel and nearly so to native boats. At Band-i-Kir the stream is from 40 to 100 yards wide, with general depths of from 3 to 6 feet, under the telegraph wires there a rocky ridge leaves a very narrow channel, barely permitting the passage of the steamers. Between Saiyid Hassan and Dalatad the channel is full of dangerous snags, evidently very firmly rooted.

Kyat Peak, a triangular shaped summit of the nearest range of hills, is an excellent mark.

The banks of the river in this locality are from 30 to 40 feet high, and a few miles above Band-i-Kir the remains of an old ruined city are discernible, embedded in the cliff. The steamers stop abreast of Shalailiyeh village, which lies about 2 miles from the river bank. A few miles higher navigation ceases.

Shushtar (lat. 31° 48′, long. 49° 00′) is a large town, with a population of about 10,000; it is the seat of the governor of Arabistan, an official appointed by the Persian Government, and has a considerable garrison. Cargo is conveyed to it from the steamers' stopping place by pack mules, the distance being about 7 miles. The principal exports are grain, cotton, wool, gum, and oil seeds; and the imports. piece and general goods from Bombay, iron from Europe, and tea from India. There are manufactures of inferior carpents and native fabrics.

In August, 1891, the S. S. *Shushan*, a stern wheeler, 80 feet long, 30 feet beam, and 2½ feet draft, ascended the Ab-i-Diz, which starting from Band-i-Kir, follows a very tortuous course through flat uncultivated country and vast jungles as far as Kut 'Abdush Shah. Entering by a channel 20 yards wide, the vessel proceeded for 1½ hours through a winding channel, with three feet of water; it then deepened to an average of 9 feet, except where barred by long sand banks about every 5 miles; in the crossings there were depths of 3 feet.

On the third day the *Shushan* arrived at Kut Bandar. Here a reef of rocks extends across the river, through which is a straight channel 4 feet deep. Then passing through intricate channels the vessel arrived at Umm al Wawieh, about 10 miles beyond Kut Bandar, and about 20 miles from Dizful by road.

Not being able to proceed farther, the return journey was commenced on the following day, and much difficulty was experienced through grounding and striking in the bends. The ascent occupied 51 hours and the descent 36 hours.

During spring and winter the Ab-i-Diz can be navigated as far as Kut 'Abdush Shah, about 80 miles by river, and a farther 10 miles by road, from Dizful, a town with a population of about 15,000, which exports rice, oil seeds, cotton, and native fabrics, and is a distributing center for imports.

Communication.—The British and Persian steamers run about weekly between Muhammera and Ahwaz, the upward passage taking 30 hours and the return 13 hours. There are Persian post and telegraph offices at Bandar Nasri (Ahwaz), Dizful, and Shushtar.

List of principal ports and anchorages.

Port.	Depth at M. L. W. S. in channel of approach.	Depth at M. L. W. S. in anchorage.	Range of tide.		Remarks.
			Springs.	Neaps.	
	Fathoms.	*Fathoms.*	*Feet.*	*Feet.*	
Abu Shahr (Bushire)..	2½	3¼– 3¾	6	5	Outer anchorage, 4½ to 5 fathoms.
Bahrein Harbor.....	4	3¼– 6	6½	5	
Bandar Abbas.....	(1)	4½– 2½	12	.....	Anchorage is about 3 miles offshore.
Basidu.....	3½	5 – 7	10	.....	
Basra.....	[2] 1¾	6 – 8	[2] 10	[2] 7½	Vessels of 20 feet draft can sometimes reach Basra, depending on bar of the Shatt al Arab.
Jashk Bay.....	10–5	5 – 4	9	0	
Kuweit Harbor.....	5	3 – 5	11½	8	Outer anchorage 6 to 10 fathoms; deep water in approach.
Linga (Lingeh).....	(1)	5½– 4	.....	.....	
Maskat Cove.....	(1)	5 –10	9	6	The cove is from ¼ to ½ mile in width.

[1] Deep water. [2] Bar.

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