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GERMANY: COAST REPORT NORTH SEA

PART II

THE COAST, PORTS, AND COAST DEFENCES

SECTION 3

BREMERHAVEN WESER RIVER
BREMEN ELBE RIVER
HAMBURG

MARCH, 1915

OFFICE OF NAVAL INTELLIGENCE



DECEMBER, 1917

WASHINGTON
GOVERNMENT PRINTING OFFICE
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NAVY DEPARTMENT,
OFFICE OF NAVAL INTELLIGENCE,
Washington, December 15, 1917.

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ROGER WELLES,
*Captain, United States Navy,
Director of Naval Intelligence.*

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infraction of the Official Secrets Act.]

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HAMBURG.**

MARCH, 1915.

**ADMIRALTY WAR STAFF,
Intelligence Division,
June, 1915.**

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GERMANY—COAST REPORT (NORTH SEA).

PART II.—SECTION 3.

BREMERHAVEN. WESER RIVER. BREMEN. ELBE RIVER. HAMBURG.

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BREMERHAVEN.

(See Chart 9 and Plan 12.)

General Description.

Bremerhaven is on the right bank of the Weser, 35 nautical miles below *Bremen*, and 30 miles from the sea (*Aussen Jade* light vessel).

As the depths of the *Weser River* in the approaches to *Bremen* (see page 22) do not admit the approach of large vessels to that port, Bremerhaven is the terminus for such commerce as is carried on by larger ships with it.

APPROACHES.

The approach* to Bremerhaven is by the *Weser River* or by the *Aussen Jade* and the *Weserfahrt*.

Aussen Jade and Weserfahrt (see under "Wilhelmshaven," Section 2).

The *Aussen Jade* is divided into two channels by the *Jade Plate* and *Minsener Sand*.

The two channels are the **MINSENER CHANNEL** and the **ALTE JADE**.

The **WESERFAHRT** is a channel between two shoals called the *Roter Grund* and the *Mellum Plate*.

MINSENER CHANNEL.

The route *via* the Minsener Channel, being indirect, is not dealt with here, but details will be found under *Wilhelmshaven* "Approaches," Section 2.

ALTE JADE.

This channel lies in a N.W. b. W. and S.E. b. E. direction and is well buoyed on both sides, the greater number of the buoys being removed in war (see under "Wilhelmshaven," Section 2).

WESERFAHRT.

This is the deepest channel over the shoal bridge joining the *Roter Grund* and the *Mellum Plate*.

It is marked by a buoy and is passed on an E. and W. course, just to the northward of the buoy.

Weser River.

The Weser River is divided, at the *Roter Sand*, into three channels, the **WESER**, the **ALTE WESER**, and a small unnamed channel.

WESER CHANNEL.

This is the main channel of the *Weser River*, and lies in a W. b. N. and E. b. S. direction between the *West Roter Sand* and the *Roter Grund*.

It is well buoyed and there is a lighthouse, built on a small shoal, near its eastern extremity. This lighthouse is lit electrically, the current being conveyed by a submarine cable from the island of *Wangeroog*.

ALTE WESER.

This channel lies in a N.W. and S.E. direction between the *West* and *East Roter Sand*. It is very sparsely buoyed.

SMALL CHANNEL.

There is a small gap between the sands and shoals which extend in a north-northwesterly direction from the *Tegeler Plate* and the *East Roter Sand*.

This gap forms a channel for medium-sized ships and lies in a N.N.E. and south-southwesterly direction.

There is a light buoy near the western side of the northern entrance and a nun-buoy near the eastern side of the southern entrance.

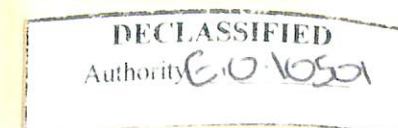
All these channels meet in the vicinity of the *Roter Grund* and, from this point on, the channel is that of the bed of the *Weser River* as far as the *Robben Plate*.

At this point there are three channels, the **DWARS GAT**, the **ROBBEN CHANNEL**, and the **FEDDERWARDER CHANNEL**.

* The sand banks in this approach are continually shifting and the bouys are moved to correspond with the movement of the channels. The depths are, however, only subject to small alteration.

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DWARS GAT.

This is the principal channel and lies between the *Robben Plate* and the *Wurster Watt*. Between *Solthoren* and *Wremen* (on the right bank of the river) this channel is known as the

Wurster Channel.

It is entered on an E. b. S. course and gradually bends to the southward until the course is about S.S.E.

It is well buoyed and lighted.

ROBBEN CHANNEL.

The *Robben Plate* has a small channel running through it in a W.N.W. and E.S.E. direction called the Robben Channel. It is not buoyed and is continually shifting.

That part of the Plate lying to the northward of the channel is called the *Kleine Robben Plate*.

FEDDERWARDER CHANNEL.

This channel lies between the *Robben Plate* and the *Hohe Weg* and runs in a N.W. and S.E. direction.

When about abreast of the middle of the *Robben Plate* it splits into two, the FEDDERWARDER FAHRWASSER and the WREMER LOCH. It is well buoyed.

FEDDERWARDER FAHRWASSER.

This is a cul-de-sac, which leads to *Fedderwardsiel* (see Section 2, where it is described).

WREMER LOCH.

This is a well-buoyed channel leading right up to Bremerhaven on the S.W. side of the *Robben Plate* and the N.E. side of the *Lang Lutjen Sand*.

Depths.

The greatest draught on which a vessel can reach Bremerhaven at L. W. O. S. is 24 feet. The Springs rise is 11 feet and the Neaps $9\frac{3}{4}$ feet at the *Roter Sand* Lighthouse, the corresponding figures for Bremerhaven being $12\frac{1}{2}$ feet and $11\frac{3}{4}$ feet.

High tide occurs at the *Roter Sand* Lighthouse $1\frac{1}{2}$ hours before it does at Bremerhaven.

ALTE JADE.

The least water in the Alte Jade is 27 feet L.W.O.S. ($37\frac{1}{2}$ feet H.W.O.S.) at a point N. (true) of Minsener Old Oog.

WESERFAHRT.

The least water to the northward and near the buoy is 27 feet L.W.O.S. (38 feet H.W.O.S.).

WESER CHANNEL.

About 400 yards N.W. of the *Roter Sand* Lighthouse a depth of 33 feet L.W.O.S. (44 feet H.W.O.S.) is found, and about 850 yards S.E. of it there are $28\frac{1}{2}$ feet L.W.O.S. ($39\frac{1}{2}$ feet H.W.O.S.).

These are the shoalest spots in this channel.

ALTE WESER.

The least water in this channel lies midway between the S.E. end of the West Roter Sand and the N.W. end of the East Roter Sand.

At this point there are 24 feet of water at L.W.O.S. ($34\frac{1}{2}$ feet H.W.O.S.).

SMALL CHANNEL.

At about the centre of this channel there are $19\frac{1}{2}$ feet at L.W.O.S. ($30\frac{1}{2}$ feet H.W.O.S.), this being the shoalest spot.

WESER RIVER.

Between the *Roter Grund* and the *Robben Plate* the least water is 36 feet L.W.O.S. at a point midway between the *Roter Grund* and the *Tegeler Plate*.

DWARS GAT.

The least water in this channel is 24 feet L.W.O.S. ($35\frac{3}{4}$ ft. H.W.O.S.) at its junction with the *Robben Channel*.

ROBBEN CHANNEL.

There are not more than 9 feet of water L.W.O.S. ($20\frac{3}{4}$ feet H.W.O.S.) in this channel at its junction with the *Dwars Gat*.

FEDDERWARDER CHANNEL.

The shoalest spot in this channel is just at the entrance of the *Wremer Loch* and carries 30 feet L.W.O.S. ($41\frac{1}{2}$ feet H.W.O.S.).

WREMER LOCH.

There are only 15 feet L.W.O.S. ($27\frac{1}{4}$ feet H.W.O.S.) on the bar W. b. N. of *Imsum*, where the best crossing into the *Wurster Channel* (*Dwars Gat*) is situated.

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THE BED OF THE WESER RIVER.

As far as Bremerhaven, that portion of the river which has to be traversed has a least depth of $22\frac{1}{2}$ feet L.W.O.S. ($34\frac{3}{4}$ feet H.W.O.S.). This least depth is in the middle of the channel just off the *Brinkama Hof* lighthouse.

Groins and Dams.

Many groins and dams have been built on the edges of the sand and mud-banks for the purpose of controlling the river. Some of these are covered at high-water, and, though in peace, they are marked by buoys, it is probable that in war they would be unmarked, and caution should be exercised whenever obliged to close the side of a channel.

Anchorages.

There is good anchorage in 7 to 8 fathoms (L.W.O.S.) in the *Fedderwarder Channel*, and in 7 fathoms (L.W.O.S.) in the *Dwars Gat* southwest of *Meyers Legde* close to the eastern side of the channel.

Ice.

Observations taken during a period of 8 years show that ice appeared on an average 20 days per annum.

The channels are now kept open by ice-breakers, though during some winters no ice has formed.

COMMERCIAL PORT.

Position.

The port stretches for a distance of about $3\frac{1}{2}$ miles on the right (East) bank of the *Weser River* at the confluence of the *Geeste River*.

For the purposes of this report the three towns (with their harbours) of Lehe, Bremerhaven, and Geestemünde are treated as one, since Lehe and Bremerhaven are practically one and Geestemünde is only separated from the latter by the *Geeste River* which is, at this point, only about 60 yards wide.

Administration.

The town and harbour of Bremerhaven stand on an area ceded in 1827 by the Kingdom of Hannover to the Hansa-town *Bremen*, whose harbour being far up the *Weser*, was too shallow to admit of the entry of the larger trading vessels then coming into use.

The area has been added to by treaties dating from 1861, 1869, 1892, and 1905.

The town of Lehe, although only separated from Bremerhaven by the width of a street, is in the province Hannover of Prussia.

Geestemünde is also in Hannover.

The port is the terminus of most of the services of the Norddeutscher Lloyd and the administration of this company, one of the largest shipping companies in the world, asserts its influence on the administration of the port.

Moles and Piers.

As at most other places on this coast, the land is very low-lying, in fact the three towns are barely at high-water level.

In consequence there are dykes all along the river bank and, from the approaches, these have the appearance of moles.

For regulating the tides many groins have been built out from the river banks and in some cases these are used as piers.

There are, however, no piers in the immediate vicinity of the towns.

GEESTEMÜNDE HARBOUR.

This may be divided into the tidal and the non-tidal harbours, the tidal harbour being south of the non-tidal.

Tidal Harbour.

This consists of only one basin, built in 1892-96, called the *Fischerei Hafen*.

Its shape is roughly that of the arc of the circumference of a circle and it is used entirely for the accommodation of fishing and small local passenger vessels.

It is 4,265 feet long and has a mean width of 230 feet. Its depth is 13 feet L.W.O.S. ($25\frac{1}{2}$ feet H.W.O.S.).

It is entered on an easterly course, but within 350 feet of the entrance it turns 8 points to the southward, then gradually bends back towards the eastward, finishing in an east-southeasterly direction.

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The western and southern side has a wooden quay for the whole of its length, the other side has a stone quay for about half its length at the upper end (see "QUAYAGE," Summary, page 8).

Both quays are served by the railway, but on the outer half of the western quay the line is about 80 yards from the water.

There is a hand crane (capacity unknown) on the western quay (see "LIFTING APPLIANCES," Summary, page 8).

At the head of the harbour are two patent slips (see "DOCKS," Summary, page 11).

Practically the whole of the western quay is taken up by fish packing and auction sheds behind which are storehouses for ice. There is also an ice factory.

The northeastern quay is used for storing coal, and small vessels coal alongside.

All the quays are 5½ feet above M.H.W.S.

Non-Tidal Harbour.

This harbour has five basins.

1. Handels Hafen.
2. Ausrüstungs Hafen.
3. Haupt Kanal.
4. Quer Kanal.
5. Holz Hafen.

HANDELS HAFEN.

This is a rectangular basin lying in a N. b. W. and S. b. E. direction and measuring 1,830 feet long and 383 feet wide, giving an area of 16 acres.

It is 25 feet deep and is entered from the Geeste River at a point about 250 yards above its confluence with the Weser, by means of a lock.

The lock is 239.5 feet long, 74.8 feet wide, and 26½ feet deep, M.H.W.S., on the sill.

The railway serves the East and West quays, on the former there are three grain storehouses and on the latter two large goods sheds.

There are 14 hydraulic cranes on the Eastern quay with a capacity of 1 to 2½ tons, and a hand crane of 20 tons capacity, and on the Western quay six hydraulic cranes of 1 to 2½ tons capacity, and one 5-ton hand crane (see "LIFTING APPLIANCES," Summary, page 8).

This basin is within the free area for fiscal purposes.

AUSRÜSTUNGS HAFEN.

This was formerly the "Petroleum Hafen," but the oil tanks and stores have been removed and the whole basin and quays have been leased to the G. Seebeck Aktien Gesellschaft, a shipbuilding and repairing firm.

The basin is entered at the southwest corner of the Handels Hafen through a dock gate (caisson) 82 feet wide and 18½ feet deep on the sill.

The area of the basin is 2½ acres, its length being 754½ feet and width 143¾ feet. Its depth is believed to be 18 feet and it is approximately rectangular in shape.

At the southwest corner there are three building slips (see "SLIPS AND BUILDING CAPACITY," page 10) and at the head of the basin there are two dry docks (see "DOCKS," Summary, page 11).

Both quays of this basin are served by the railway.

On the West quay there are six travelling hydraulic cranes of 1½ tons capacity and a fixed crane of 5 tons capacity (see "LIFTING APPLIANCES," Summary, page 8).

The lessees of this basin also own a 150-ton floating crane, which is usually in this basin.

HAUPT KANAL.

About 200 feet from the lock of the Handels Hafen and on the east side of this basin is the entrance to the so-called Haupt Kanal which branches off in an E. b. N. direction.

This is not a canal, but is one of the basins of Geestemünde Harbour.

It is 1,250 feet long, 145 feet wide, and is 23 feet deep at its western end, gradually shoaling to 20 feet at its junction with the Quer Kanal and the Holz Hafen.

The railway runs the whole length of the southern quay.

A road-bridge crosses the basin about midway along its length. This bridge is a swing-bridge and it carries a tram-line as well as a carriage-way and footpath.

There are said to be two cranes on the South quay worked by hand and with capacities of 1 and ¾ ton, respectively.

As far as the road-bridge this basin is in the "free-area" (see under "HANDELS HAFEN").

QUER KANAL.

This is another basin which branches off near the head of the Haupt Kanal in a northerly direction.

It is 1,555 feet long, 108 feet wide, and is 20 feet deep at its southern end, gradually shoaling to 18½ feet at the northern end.

The Eastern quay is crowded with warehouses, behind which runs the railway.

On the West quay there are three blocks of warehouses which extend the full length of the basin. The southern block is the store for the Mining Dépôt (see page 20).

At the northeast corner of the basin are the fleet magazines (see "WAR MATERIAL," page 21).

It is not known what cranes exist on the quays of this basin.

HOLZ HAFEN.

This is an irregularly shaped basin covering an area of about 6 acres lying to the eastward of the Haupt Kanal.

It is only 5 feet deep and is used mainly as a timber pond.

A branch of the railway runs along its northern side.

Geeste River.

This river, which forms the boundary between Bremerhaven and Geestemünde, has been deepened by dredging to 20 feet M. L. W. S., above the entrance to the *Handels Hafen* of Geestemünde.

The greatest depths are to be found near the left bank, and ships drawing 28 feet have reached Rickmer's Shipyard, 1 mile above the lock of the *Handels Hafen*, at high water.

Although there are stone quays on the Bremerhaven side (right bank), this dries out about 10 yards at low water.

Immediately on entering the Geeste from the *Weser* the canal leading to the *Alter Hafen* (Bremerhaven) (see page 5) will be seen branching to the northeastward. About 200 yards farther is the entrance to the *Handels Hafen* (Geestemünde) (see page 4).

About 50 yards above this are the starting piers of the ferries to the *Fischerei Hafen* (see page 3), *Blexen* (see 22), and *Nordenham* (see 23). Some of the local passenger steamers use these piers also.

About 600 yards above the piers is the only bridge connecting Bremerhaven and Geestemünde.

It is a steel swing bridge 141 feet long and carries the roadway and a tram line.

Between the ferry piers and the bridge on the right bank the *Seebeck Aktien-Gesellschaft* have three building and repair docks, as also another some 450 yards above the bridge and yet another on the left bank some 300 yards above the bridge for a distance of 520 yards, and the whole of the bank is taken up with docks and building slips.

Messrs. Tecklenborg own the remainder of the left bank above the bridge for a distance of 520 yards, and the whole of the bank is taken up with docks and building slips.

Just above Tecklenborg's works and on the right bank is Rickmer's Shipbuilding Works.

For details of these establishments, see under "PRIVATE SHIPBUILDING YARDS," page 13.

There appear to be only three small cranes on the river quays (exclusive of private shipbuilding yards). These are two travelling ¾-ton steam cranes and one 5-ton hand crane. (See "LIFTING APPLIANCES," Summary, page 9.)

BREMERHAVEN HARBOUR.

This harbour is divided into four main basins:

1. Alter Hafen.
2. Neuer Hafen.
3. Kaiser Hafen.
4. Repairing Basins.

There are four entrances to these basins:

1. Alte Schleuse.
2. Neue Schleuse.
3. Kleine Kaiser Schleuse.
4. Grosse Kaiser Schleuse.

All the basins are nontidal, the entrances being provided with locks or gates.

Alter Hafen.

This is the oldest of the basins, having been built in 1827-30 and widened in 1860-62. It lies in a west-northwesterly and east-southeasterly direction, and is entered by a short canal at the confluence of the *Geeste* with the *Weser*.

This canal is about 250 yards long and terminates in the *Alte Schleuse*, a lock 279 feet long, 36 feet wide at the entrance (internal width 85½ feet), and 23 feet deep on the sill M. H. W. S. The lock is opened two hours before high water and closed at high water.

The *Alter Hafen* is 2,460 feet long, and varies in width from 282 to 377 feet. It is 23 feet deep and has an area of 17.8 acres.

It has stone quays all around on which stand warehouses, and behind these, except for a short distance near the entrance where they run close to the water's edge, branches of the railway run (see "QUAYAGE," Summary, page 8).

There are three hand cranes on the quays, a 7½-ton and a 5-ton on the western quay, and a 2-ton on the eastern quay.

This basin is only used by coasting and fishing vessels and tugs.

Near the S. W. corner are large auction and packing sheds for the fish industry.

Neuer Hafen.

This basin was built in 1847-52, enlarged in 1858 and again enlarged and deepened in 1870-71.

It lies W. N. W. and E. S. E., and is entered by a short canal from the Weser. The canal is about 220 yards long and terminates in the *Neue Schleuse*, which consists of three dock gates. The inner gates are hinged double gates, and the outer one is a sliding caisson. There is a duplicate outer caisson kept near the E. S. E. corner of the basin, for use in case of damage to the original caisson.

Ordinarily only the outer gate is used, but when exceptional tides occur (with n rth-westerly winds) the other gates are closed in addition. They are somewhat higher above high-water level. Distance between the gates, 108 feet.

The gates have a useful width of $72\frac{1}{2}$ feet and a depth of $25\frac{1}{2}$ feet M. H. W. S. on the sills. The Neuer Hafen is 2,780 feet long and, starting from the southern end, is 282 feet wide for 600 feet, 380 feet wide for 1,180 feet, and 328 feet wide for 1,000 feet of its length.

It has, therefore, an area of about $20\frac{1}{2}$ acres and is $29\frac{1}{2}$ feet deep.

This basin is connected, at the northern end, to the Kaiser Hafen I by a dock gate which has a useful width, when open, of $52\frac{1}{2}$ feet and a depth over the sill of $24\frac{1}{2}$ feet. This gate is known as the *Verbindungs Schleuse*.

About half-way between the *Neue Schleuse* and the *Verbindungs Schleuse* is the old dry dock of the Norddeutscher Lloyd (see "Docks," Summary, page 11).

The basin has stone quays, on which stand large warehouses and goods sheds, those at the southwestern end being coal sheds (see "COAL," page 12).

All the quays are well served by branch lines of the State Railway.

Between the dry dock and the *Verbindungs Schleuse* there are three power cranes of 75 (steam), 1.5 and 1.5 tons capacity, respectively. On the eastern quay there are two cranes of $12\frac{1}{2}$ and 8 tons capacity, respectively, (see "LIFTING APPLIANCES," Summary, page 9).

This basin, except for the narrow part at the southern end, is included in the "free area" for fiscal purposes, as also are all the basins described below.

Kaiser Hafen.

This is a group of three basins all opening off a central wider portion called the *Wendeplatz* near the *Grosse Kaiser Schleuse*.

The basins are known as Kaiser Hafen I, II, and III, Kaiser Hafen I being the southern-most of the three.

KAISER HAFEN I.

This basin was built in 1872-76 and was extended, and the *Wendeplatz* added in 1892-97.

It is of irregular shape and lies in a N. b. W. and S. b. E. direction and has two entrances, the *Kleine Kaiser Schleuse* and the *Grosse Kaiser Schleuse*.

The *Kleine Kaiser Schleuse* is near the middle of the basin, and is a dock gate with three double valves. Its useful width, when open, is $55\frac{3}{4}$ feet, with a depth over the sill of 27 feet H. W. O. S. It is approached from the *Weser* by a canal 230 yards long.

The *Grosse Kaiser Schleuse* is reached by a canal, about 290 yards long, from the *Weser*, and it opens onto the *Wendeplatz*. It is a large lock, with two double valves at the outer end and a caisson at the inner end.

Its dimensions are: Length, useful, $705\frac{1}{2}$ feet; total, $732\frac{1}{2}$ feet; width, 91 ft. $11\frac{1}{2}$ in.; and depth on sill, 38 feet M. H. W. S. ($25\frac{1}{2}$ feet M. L. W. S.).

The Kaiser Hafen I, together with the *Wendeplatz*, is 4,659 feet long, and varies in width from 360 to 892 feet, and covers an area of $51\frac{1}{4}$ acres.

The southern end is $29\frac{1}{2}$ feet and the northern end $31\frac{1}{4}$ feet deep, the *Wendeplatz* being $36\frac{1}{4}$ feet deep. The water level in the whole of the Kaiser Hafen is allowed, however, to fall some $4\frac{3}{4}$ feet occasionally.

The quays of the Kaiser Hafen I are of stone, and, in most places, are $11\frac{1}{4}$ feet above the ordinary water level.

The railway runs close to the water's edge of the western quay and behind large warehouses on the eastern.

There are three cranes on the western quay of 15, 20, and 30 tons capacity, respectively; the first is a travelling steam crane, the second is worked by gas engine and the last by hydraulic engine. On the eastern quay there is one hand crane of 20 tons capacity.

At the corner of Lloyd Strasse and Anker Strasse are the administrative offices of the Nord Deutsche Lloyd.

To the south of *Kleine Kaiser Schleuse* the same company has its ships' storehouses.

To the north of *Kleine Kaiser Schleuse* are the victualling stores of the Nord Deutsche Lloyd and the naval storehouse for the guns which are to be carried by this company's ships when they are converted into armed merchant cruisers. North of the latter is a small shed containing torpedo nets, which are probably intended for protecting the dock gates.

Just to the eastward of the outer gates of the *Grosse Kaiser Schleuse* is the electric and hydraulic power station, which supplies power for the cranes and lock gates and caissons.

E. b. N. of this and on the opposite side of the basin is the petroleum store.

Pt. II, sec. 3.

The canal outside the *Grosse Kaiser Schleuse* has stone quays, and on the Western quay stands the *Lloyd Halle*, the principal passengers and goods offices of the N. D. L.

The Lloyd Halle has a passenger and light goods station annexed to it, and it is here that passengers embark, the steamers of the N. D. L. coming out of the harbour earlier and lying alongside this quay.

KAISER HAFEN II.

This basin branches off from the *Wendeplatz* in a north-northeasterly direction, and is approximately rectangular in shape. It was completed in 1908.

It is 1,640 feet long, 410 feet wide, and $34\frac{1}{2}$ feet deep, and covers an area of $14\frac{7}{8}$ acres.

It has two large goods sheds on its southeastern quay, in front of and behind which the railway runs.

The quays are of stone on the southeastern side of the basin, but at the head and north-western side there are sloping banks (1 in 2) where extensions of the basin are projected.

There is a slipway and two landing stages at the head (north end) of the basin, belonging to the Harbour Works Department.

On the west side of the basin are 15 dolphins for the use of lighters and small craft.

There are 12 electric $2\frac{1}{2}$ -ton cranes on the southeastern quay (see "LIFTING APPLIANCES," Summary, page 9).

KAISER HAFEN III.

This basin branches off from the *Wendeplatz* in a northerly direction, and is rectangular in shape. Built 1906-09.

It is 1,968 feet long, $508\frac{1}{2}$ feet wide, 35 feet deep, and covers an area of about 23 acres.

Its quays are of stone except at the head of the basin, where they are built of wood on account of the projected extension.

On the eastern quay there are three large goods sheds served by the railway both in front and behind. Each shed has five electric $2\frac{1}{2}$ -ton cranes in front of it (see "LIFTING APPLIANCES," Summary, page 9).

The western quay has a double railway track close to the water's edge, beyond which is an area reserved for stacking coal.

This basin is entirely given over to the N. D. L., and it is here that their largest vessels ship goods.

Repairing Basins.

This part of the harbour comprises two basins, the *Dock Vorbassin* and the *Verbindung Hafen*.

DOCK VORBASSIN.

This is a small roughly triangular basin lying to the northwestward of the *Wendeplatz* of the Kaiser Hafen and, as its name signifies, is only an entrance to the large dry docks and the *Verbindungs Hafen*. It was built in 1896-99.

It is entered from the *Wendeplatz* through a dock gate with a single caisson. This gate has a width, when open, of 114 feet 10 inches, and a depth over the sill of 36 feet.

The basin has an area of nearly 7 acres, and all its quays are of stone and well served by branch lines of the State Railway.

On its north side is the *Kaiserdock No. 1*, a large dry dock (see "Docks," Summary, page 11), and at its northwestern corner it opens into the main basin of the *Verbindungs Hafen*.

On the corner of the quay at the entrance to the *Verbindungs Hafen* is an electric turret crane with a capacity of 150 tons.

In this basin there are also two electric and one steam crane of 50 and 20 tons capacity respectively (see "LIFTING APPLIANCES," Summary, page 9).

VERBINDUNGS HAFEN.

This is an irregular shaped basin opening directly off the *Dock Vorbassin* at its north-western corner. It was built in 1905-09.

Its greatest length is 2,575 feet and greatest width 738 feet, and it is believed to be 36 feet deep. It covers an area of about 32 acres.

Near its northeastern corner is the *Kaiserdock No. 2*, a large dry dock (see "Docks," Summary, page 11).

The eastern quay is of stone, and it is not known how the others are constructed; all are, however, served by a branch of the State Railway.

On the eastern quay near the opening into the *Dock Vorbassin* there is an electric 150-ton crane.

Projected Extensions.

KAISER HAFEN II.

It is proposed to extend this basin in a N. b. E. direction by about 5,000 feet, the existing width being maintained.

Pt. II, sec. 3.

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KAISER HAFEN III.

This basin is to be lengthened by about 4,550 feet, the existing width being maintained for about 600 feet.

NEW ENTRANCE.

A new entrance from the Weser is in process of construction about 1,270 yards N. N. W. of the entrance to the Grosse Kaiser Schleuse.

This entrance is to be provided with a lock 850 feet long and 197 feet wide, the gates, when open, to leave a clearance of 115 feet, depth on the sill (M. H. W. S.) to be 37½ feet.

NEW VORBASSIN.

A new basin of irregular outline at the head of the lock to be called the Vorbassin des Nord Hafens.

This basin will be connected by a short canal with the existing Verbindungs Hafen, and will open directly into the projected Nord Hafen.

NORD HAFEN.

This is to consist of a triangular basin, the apex of which connects directly with the Vorbassin des Nord Hafens, and from the base three rectangular basins will branch off in a N. b. E. direction.

Each basin is to be about 4,000 feet long and about 495 feet wide, and it is understood that the depth will be about 36 feet.

Quayage.

SUMMARY.

Table with columns: Town, Basin, Position, Length, Depth alongside. Lists details for Geestemünde and Bremerhaven.

Lifting Appliances.

SUMMARY.

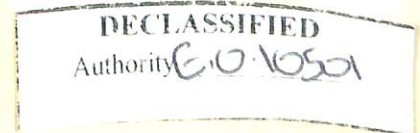
Table with columns: Town, Basin, Position, No., Capacity, Power, Radius, &c. Lists lifting appliances for Geestemünde.

Pt. II, sec. 3.

Main table for Bremerhaven with columns: Town, Basin, Position, No., Capacity, Power, Radius, &c. Lists various basins and their lifting equipment.

It is not known whether there are any lifting appliances in the Verbindungs Hafen, but it is reported that there are some travelling cranes near the Kaiser Dock II.

Pt. II, sec. 3. 29542-18-3



Slips.

SUMMARY.

| Town. | Position. | Length. | Breadth. | Height of Gantries. | Remarks. | |
|------------------------------------|---|---|--------------------|---------------------|---|-----|
| Geestemünde..... | S.W. corner of Ausrüstungs Hafen. | <i>Feet.</i> 250 | <i>Feet.</i> 32 | <i>Feet.</i> — | Close alongside each other. Belong to G. Seebeck A.-G. | |
| | | 130 | 25 | — | | |
| | | 125 | 23 | — | | |
| | S. end of Ausrüstungs Hafen (Building Docks). | 550 | 83½ | 88½ | Each dock has 2 lifters of 5 and 8 tons capacity respectively on the top of gantries. Building docks, 21½ feet deep. (For further details see "Docks," page 11). Belong to G. Seebeck A.-G. (see page 13). | |
| | | 500 yards above swing bridge over Geeste River (left bank). (Tecklenborg's Yard). | 550 | 83½ | | 88½ |
| | | 279 | 36 | — | | |
| | | 328 | 39½ | — | | |
| | | 361 | 46 | — | | |
| | | 459 | 52½ | 124½ | | |
| | | 590½ | 72 | 128 | | |
| 755 | 88 | 135 | | | | |
| Bremerhaven..... | 550 yards above swing bridge over Geeste River (right bank). (G. Seebeck A.-G). | 820 | 91 | 135 | Building dock } Electric lifter on gantries over both dock and wing, capacity 2½ tons. | |
| | | 360 | 51 | 58½ | | |
| | | 285 | 44 | 55½ | | |
| | 1,200 yards above swing bridge over Geeste River. Rickmer's Yard). | ? | ? | ? | Wing of above } Three slips capable of taking ships up to 230 feet in length. Details lacking. Longest is capable of taking vessels up to 450 feet in length. In 1910 a vessel 365½ feet long was launched from No. 2 slip. Small slips for harbour craft. Belong to Harbour Authorities. | |
| | | ? | ? | ? | | |
| | | ? | ? | ? | | |
| | | ? | ? | ? | | |
| Kaiser Hafen II., at North corner. | ? | ? | ? | Broadside | | |
| | ? | ? | ? | | | |

Building Capacity.

G. SEEBECK A.-G.

This firm can build ships up to 550 feet in length, and is tendering for warships, but had received no orders from the Government up to the end of July 1914.

The largest vessel built to date, (January, 1915), is one of about 2,800 tons (gross), 280 feet long.

An aggregate of 13,400 tons was built in 1913.

This firm builds engines (both steam and Diesel), boilers, superheaters, &c.

JOH. C. TECKLENBORG A.-G.

At this yard both merchant vessels and warships have been built, of the latter only very small vessels; of the former the largest are one of 17,500 tons (gross), 615 feet long, and two of 12,200 tons (gross), 490 feet long.

This firm also built in 1911-12 an internal combustion engined ship of 2,600 tons (6-cylinder, 1,500 h.p.) for the Hansa line.

A total of 88,750 tons (gross) was built in 1912.

Engines, both steam and motor, but not turbine, and boilers are built by this firm.

RICKMERS A.-G.

This firm, so far, has only built merchant vessels, of which the largest were one of 8,000 tons (gross), about 410 feet long, one of 6,000 tons (gross), 365½ feet long, and one of 5,140 tons (gross), 350 feet long. It is, however, capable of building vessels up to 10,000 tons (gross), 450 to 800 feet long.

During 1912 a total of about 17,800 tons (gross) was built.

This firm does not build boilers, but has built small engines.

Docks.

SUMMARY.

| Dock. | Position. | Length. | Width. | Depth over blocks. | Width at entrance. | Remarks. |
|-----------------------|---|---------------------|---------------------|---------------------|--------------------|--|
| Seebeck A.-G..... | S. end of Ausrüstungs Hafen, Geestemünde. Geeste River. | <i>Feet.</i> 550 | <i>Feet.</i> 83½ | <i>Feet.</i> 17½ | <i>Feet.</i> 73 | These are building docks, length on bottom, 515 feet. |
| | | 550 | 83½ | 17½ | 73 | |
| | | 320 | — | — | — | |
| | | 185 | — | — | — | |
| | | 550 | 72 | 21 | 65 | |
| | | 210 | — | 16 | 45 | |
| | | 175 | — | — | — | |
| | | 550 | — | 19½ | 72 | |
| | | 240 | — | — | — | |
| | | 360 | — | 16 | 51 | |
| Tecklenborg A.-G..... | " " " " | 285 | — | 15 | — | This was built as a building dock, but is no longer so used. |
| | | 315 | — | 13 | 30 | |
| N.D.L. Dock..... | W. side Neuer Hafen. | 210 | — | 12 | 30 | Wooden bottom and sides. |
| | | 455 | — | 21 | 56½ | |
| " Wing..... | Bremerhaven..... | 375 | — | — | — | Can be pumped out in 2½ hours. |
| | | 741½ | 110 | 34½ | 100½ | |
| Kaiser Dock I..... | Dock Vorbassin..... | 544½ | 110 | 34½ | 100½ | Caisson at Outer Stop. Slope of sides, 4 in 1 at entrance. Caisson at Inner Stop. Can be pumped out in 2½ hours. |
| | | 879 | 140 | 37¼ | 131¼ | |
| " " II..... | Verbindungs Hafen..... | — | — | — | — | Three centrifugal pumps, 800 H.P. each. Slope of sides, 4 in 1 at entrance. |
| | | — | — | — | — | |
| PATENT SLIPS. | Head of Fischerei Hafen. | 120 | Forward | 9 | — | Lifting power, about 200 tons. |
| | | 120 | Aft | 17 | — | |

Repair Capacity.

The firms mentioned on pages 13-15, with the exception of Rickmers A.-G., are prepared to undertake any and all repairs. Rickmers only undertakes repairs to hull and auxiliary engines.

Machine Shops.

These firms are well provided with shops of all sorts (see Plates 1 and 2). Practically all the shops at Tecklenborg's yard were completely destroyed by fire in June 1913. They have, however, been rebuilt and refitted.

Lighting and Power.

The harbour of Geestemünde is lit by electricity, the two stations, both for power and light, being close to the southeastern end of the *Fischerei Hafen* and north of the head of the *Holz Hafen*, respectively.

It is not known how the *Alter* and *Neuer Hafen* are lit, but the *Kaiser Hafen* and the *Repairing Basins* are lighted by electricity, the station for power and light being east of the entrance to the *Grosse Kaiser Schleuse*.

This station is also the power station for the various hydraulic cranes and the hydraulically worked gates and caisson of the *Grosse Kaiser Schleuse*.

There is a large electric power station west of Lehe, due east of the head of *Kaiser Hafen III*, but it is not known whether this supplies power or light to the harbours of Bremerhaven.

Water.

GEESTEMÜNDE.
Water, fit for drinking, is supplied to ships from hydrants on the wharves from the town waterworks (see page 17).

BREMERHAVEN.
The town waterworks (see page 17) and Schwoon & Co. supply good water suitable for drinking, the former from hydrants on the wharves and the latter from tank lighters.

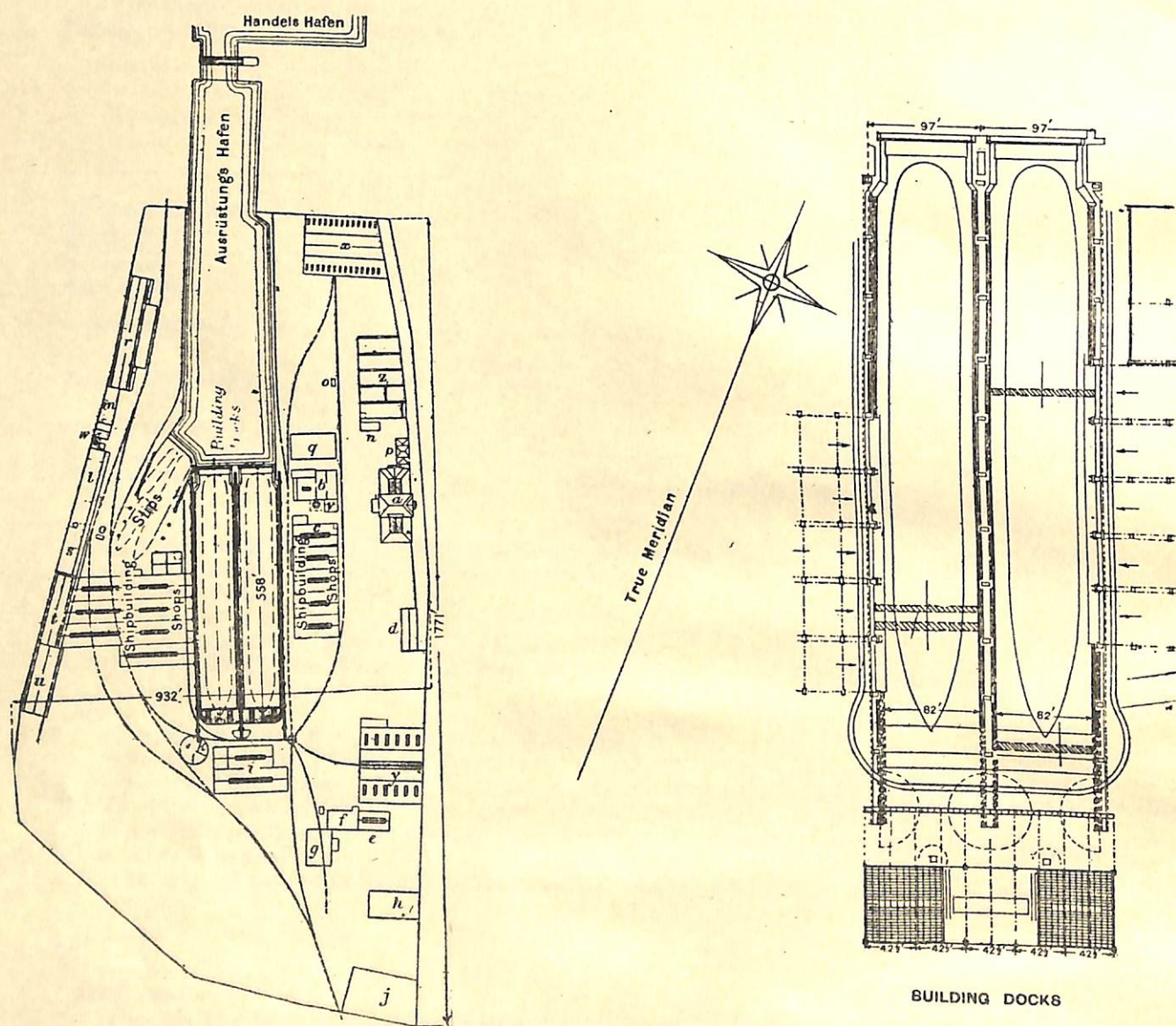


| | | | | | <i>Tons.</i> |
|----------------------------------|-------|----------------------|--------|---------|-------------------|
| Norddeutscher Lloyd..... | | | | 500,000 | 50,000 |
| Hansa Werke..... | 9,000 | | 5,000 | | 2,300 |
| F. Suhren..... | | 5,000 | 25,000 | | 1,500 |
| W. Kottke..... | | 400 | 600 | | 200 |
| Tieck & Garrels..... | | | | | 1,000 |
| German Imperial Railways..... | | | | | A large quantity. |
| Claussen & Wieting..... | 3,000 | S. England. 1,500 | 6,500 | | 4,000 |
| Schwarting & Beyer..... | | 400 | | | { 1,000 |
| V. Bachmann..... | | | 5,000 |  |  | 1,500 |
| Six Steam-trawler Companies..... | | | | 125,000 | None. ? |

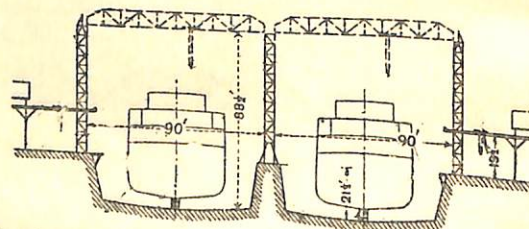
| | | <i>Tons.</i> | |
|-------------|---------|--------------|-------------------|
| ..... | ..... | 500, 000 | 50, 000 |
| ..... | 5, 000 | ..... | 2, 300 |
| 5, 000 | 25, 000 | ..... | 1, 500 |
| 400 | 600 | ..... | 200 |
| ..... | ..... | ..... | 1, 000 |
| ..... | ..... | ..... | A large quantity. |
| S. England. | ..... | ..... | ..... |
| 1, 500 | 6, 500 | ..... | 4, 000 |
| . | | | |
| 400 | ..... | ..... | { 1, 000 |
| ..... | 5, 000 | ..... | 1, 500 |
| ..... | ..... | ..... | None. |
| ..... | ..... | 125, 000 | ? |

I. D. 978, Section 3.
 PLATE 1.
 To face page 13.

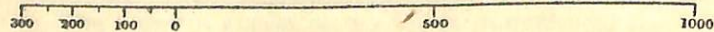
**G. SEEBECK A. G. SHIPYARD.
 BREMERHAVEN-GEESTEMUNDE.**



BUILDING DOCKS



Scale
 (in Feet)



- a Offices.
- b Main power station.
- c Smithy.
- d Canteen.
- e Iron foundry.
- f Brass foundry.
- g Finishing shop.
- h Pattern-makers' shop.
- i Bending shop.
- j New iron foundry.
- k Hydraulic riveting shop.
- l Log store.
- m Drying stove.
- n Pipe store.
- o Lavatories.
- p Watchmen's quarters.
- q Erecting shop.
- r Carpenters' shop.
- s Rivet shop.
- t Mold loft.
- u Deck fittings and plate store.
- v Galvanizing shop.
- w Small power station.
- x Boiler shops.
- y Machine shops.
- z Fitters' shops and stores.

13-1

Shipping.

| 1911. | Entered. | | | | Cleared. | | | | Total. | |
|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|----------|----------------|
| | With cargo. | | In ballast. | | With cargo. | | In ballast. | | | |
| Port. | Vessels. | Gross tonnage. | Vessels. | Gross tonnage. | Vessels. | Gross tonnage. | Vessels. | Gross tonnage. | Vessels. | Gross tonnage. |
| Bremerhaven... | 1,655 | 1,860,733 | 104 | 68,112 | 1,434 | 1,703,293 | 606 | 248,929 | 3,809 | 3,881,067 |
| Geestemünde... | 2,834 | 289,236 | 105 | 8,571 | 203 | 56,625 | 2,660 | 210,693 | 5,802 | 565,125 |
| | | | | | | | | | 9,611 | 4,446,192 |

Trade.

See under "BREMEN," page 35.

PRIVATE SHIPBUILDING YARDS.

(See Plan 12.)

Norddeutscher Lloyd, Bremerhaven.

This company has a dry dock and repairing shops (including a boiler shop) on the W. side of the *Neuer Hafen*. It also has a small repairing shop near the *Kaiser Dock*. The cranes have already been mentioned (see "LIFTING APPLIANCES," Summary, page 9).

G. Seebeck Aktien-Gesellschaft, Geestemünde (see Plates 1 and 2).

This firm has bought up the older firms of Wencke, Lange Ulrich, and Oltmann, and now possesses five docks, of which four are on the Bremerhaven side of the *Geeste River*, and one opposite.

It has acquired, by lease from the Prussian Government, an area of 32 acres round the head of the *Ausrüstungs Hafen*, and here two new building docks have been constructed.

The *Ausrüstungs Hafen*, as its name implies, is used as a fitting-out basin.

HANDS EMPLOYED.

In 1913 the firm employed, at its various yards, a total of 1,300 hands.

BASIN.

The only basin is the *Ausrüstungs Hafen* (see under "COMMERCIAL PORT," page 4).

LIFTING APPLIANCES.

There are 6 cranes of 1½ tons capacity, 1 of 5 tons, 2 of 35 tons, 1 of 90 tons, and a floating crane of 100 tons capacity (for further details, see page 9).

SLIPS AND DOCKS.

There are 6 slips (see page 10).

The dock, Seebeck No. 2, farthest up the river (see Plate 2) is used for building vessels up to 350 feet long. New workshops have been erected here. The other docks are all timber-lined, but that on the Geestemünde side has been re-lined with cement.* No floating docks are known to exist.†

The two new building docks, which are identical, have the following dimensions:

| | Feet. |
|--|-------|
| Length on bottom..... | 515 |
| Width at coping..... | 83½ |
| " on bottom..... | 75 |
| " at entrance..... | 73 |
| Depth from coping to bottom of dock..... | 21½ |

Each dock is served by two overhead gantry cranes, of 8 and 5 tons capacity, respectively. The height of the crane above the bottom of the dock is 88½ feet, and the width between the supports of the gantry is 90 feet (see under "DOCKS," page 11).

SHOPS.

The firm has engine and boiler shops on the E. side of the *Quer Kanal*.

* According to press reports, a dock measuring 534 feet long by 72 feet wide, and belonging to Seebeck A.-G., was completed in 1904. It is understood that the dock to which this refers is No. 4 dock, which now measures 550 feet in length with a width at entrance of 72 feet (see page 11).

† On the authority of a German periodical, Seebeck A.-G. possesses a floating dock.

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LIGHTING AND POWER.

The firm has two electric power stations at the *Ausrüstungs Hafen* establishment. It is not known whether the old power station at the N. yard (Geeste River) has been retained or whether it was dismantled when most of the machinery was transferred to the new yard. It was fitted with two sets of reciprocating engines developing an aggregate of 700 H.P.

COMMUNICATIONS.

The old yard is entirely unconnected with the railway and can only be reached by road or by river.

The new yard is connected by rail to the main line of the State Railway and the branches in the yard itself measure about 3,500 yards, and lead to all the shops, slips, docks, and quays.

BUILDING CAPACITY.

See page 10.

Joh. C. Tecklenborg Aktien-Gesellschaft, Geestemünde (see Plate 2).

This is the most important firm in the port, and it employed over 4,000 men in 1913. The yard is situated about ¼ to ½ mile above the swing bridge over the *Geeste River* on its left bank.

AREA AND QUAYS.

It covers an area of about 52 acres, and has a water frontage of about 5,000 feet, of which some 1,400 feet are quays, 770 feet on W. side (depth 26½ feet M.L.W.S.), and 670 feet on E. side (depth 20½ feet M.L.W.S.).

LIFTING APPLIANCES.

In the middle of the western quay there is an electric 150-ton crane and on rails on the same quay are two 5-ton travelling cranes.

At the centre of the eastern quay is a pair of 80-ton sheers (see "LIFTING APPLIANCES," Summary, page 9).

SLIPS AND BUILDING CAPACITY.

There are seven slips, details of which will be found on page 10. Nos. 4, 5, 6, and 7 slips are provided with overhead gantry cranes travelling the whole length and breadth of their respective slips.

The crane of No. 4 slip has a capacity of 5 tons, those of Nos. 5 and 6 about 7 tons, and that of No. 7 about 8 tons.

For building capacity, see under "COMMERCIAL PORT," page 10.

DOCKS.

This firm has one small dry dock situated about 150 yards above the swing bridge and is capable of undertaking all repairs.

It owns two small patent slips in the *Fischerei Hafen* for the cleaning and repair of fishing and other small craft up to 150 feet in length.

MACHINE SHOPS.

The machine and workshops cover an area of 47,500 square yards and are modern and well fitted.

The greater number of the shops were destroyed by fire in 1913, but have been rebuilt, and the opportunity was taken to bring them up to date.

LIGHTING.

The works are lit throughout by electricity generated by one of the four dynamos of the power house.

POWER.

The power house (32 on Plate 2) contains four dynamos driven by reciprocating engines, developing 300, 350, 850, and 1,000 h.p., respectively; develop 1,250 kw., continuous current at 240 volts.

Besides these there are also three air-compressors, capable of dealing with about 3,150 cubic feet of air per minute, and a large hydraulic installation.

COMMUNICATIONS.

A branch line connects the yard with the main line of the State Railway. There are 9,850 yards of railway lines in the yard itself.

Rickmers Reismühlen, Reederei und Schiffbau-Aktien-Gesellschaft, Bremerhaven.

This shipyard for iron and steel vessels and engines is situated on the *Geeste* above Seebeck's yards.

Pt. II, sec. 2.

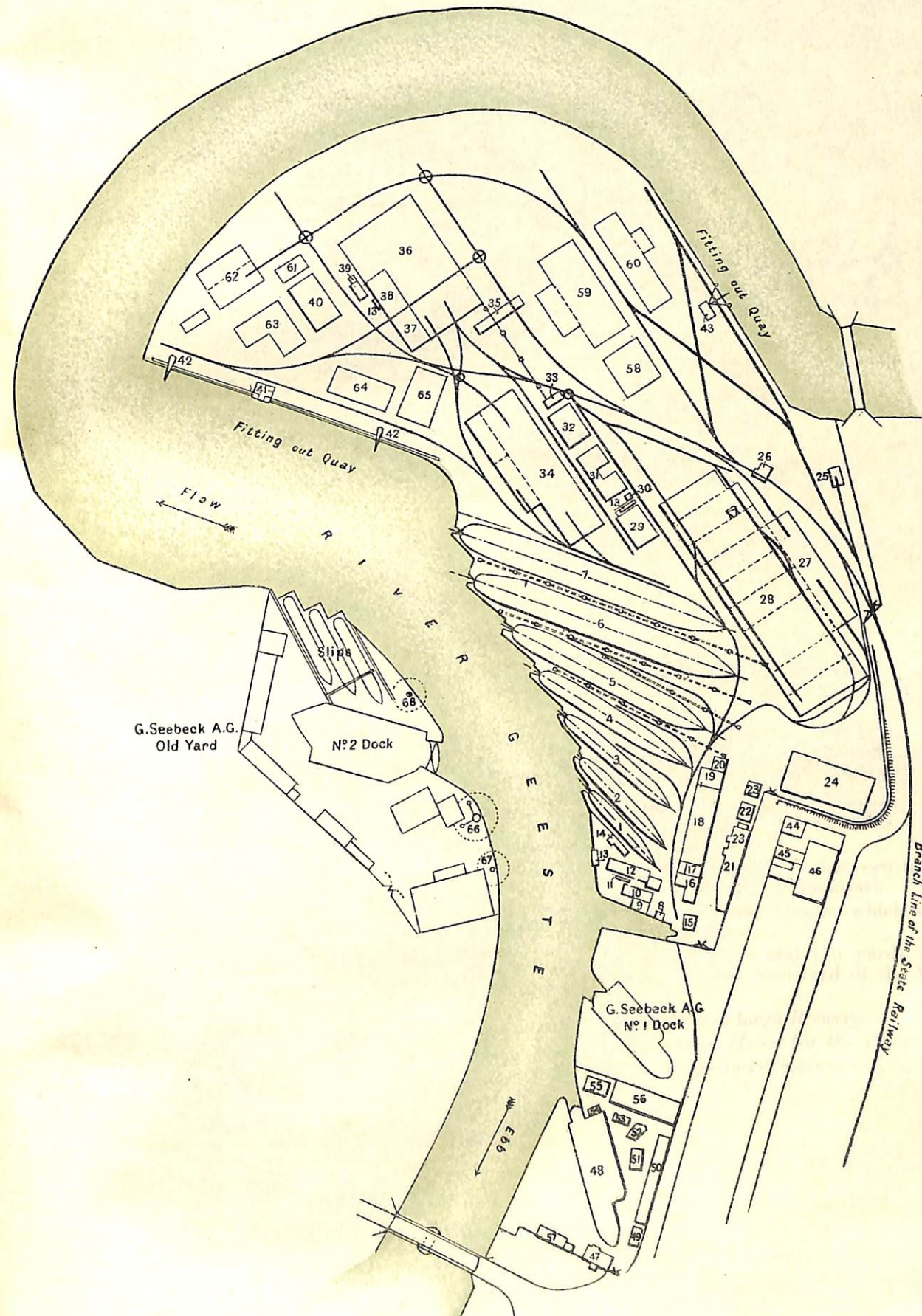
J. C. TECKLENBORG A.G. SHIPYARD,

ALSO

G. SEEBECK A.G. OLD YARD AND NO. 1 DOCK.

BREMERHAVEN - GEESTEMÜNDE.

Scale
500ft 400 300 200 100 0 100 200 300 400Yards



REFERENCE.

- | | | | |
|--|--|--|------------------------------------|
| 1 Slip for vessels of 279 ft. x 36 ft. | 19 Boiler House. | 35 Loading Crane. | 52 Mould Store. |
| 2 " " 328 ft. x 39½ ft. | 20 Engine House. | 36 Boiler Shop. | 53 Boiler House. |
| 3 " " 361 ft. x 46 ft. | 21 Canteen. | 37 Forge. | 54 Dock Pumps. |
| 4 " " 439 ft. x 52½ ft. | 22 Washhouse. | 38 Washing Room. | 55 Smithy. |
| 5 " " 590½ ft. x 72 ft. | 23 Gate House. | 39 Boiler House. | 56 Old Pattern Shop. |
| 6 " " 755 ft. x 88 ft. | 24 New Office Building. | 40 Tinsmiths' and Boilersmiths' Shops. | 57 Store Sheds. |
| 7 " " 820 ft. x 91 ft. | 25 Locomotive Sheds. | 41 150-ton Quay Crane. | 58 Pattern-makers' Shop and Store. |
| 8 Hospital. | 26 Weighbridge. | 42 Travelling Quay Crane (5 tons). | 59 Foundry (iron). |
| 9 Timber Store. | 27 Plate-laying space with Moulding Loft above (82 ft. x 262 ft.). | 43 80-ton Quay Sheers. | 60 Canteen. |
| 10 " " | 28 Platers' Sheds (19 each 66 ft. x 200 ft.). | 44 Foremen's Dwelling Houses. | 61 Galvanising Shop. |
| 11 Drying Stove. | 29 General Store. | 45 Lodging House. | 62 Saw Mill. |
| 12 Joiners' Shop. | 30 Accumulator. | 46 Store Sheds. | 63 Outfitting Shops. |
| 13 Lavatories. | 31 Boiler and Pump House. | 47 Dwelling Houses and Offices. | 64 Joiners' Shop. |
| 14 Fire-engine House. | 32 Power House. | 48 Dock. | 65 General Store. |
| 15 Gate House. | 33 Cooling Tower. | 49 Gate House. | 66 90-ton Crane. |
| 16 Old Office Buildings. | 34 Engine Shops. | 50 Store. | 67 35-ton Crane. |
| 17 Rope Store. | | 51 Foundry (brass). | 68 35-ton Crane. |

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It possesses four building slips, including one broadside slip, on the longest of which vessels up to 450 feet in length can be built.

There are no docks belonging to this company.

The number of men employed was 600 in 1913.

The yard is being extended, the necessary land for this purpose having already been acquired.

No boilers are constructed and only small auxiliary engines (*see* page 11).

Delphin Sciffbau-Aktien-Gesellschaft, Lehe.

A little over 2 miles above the swing-bridge over the *Geeste* and on the right bank there is a small shipbuilding yard belonging to this firm.

Very little is known about this yard, but it is believed that only very small vessels are built here.

THE TOWNS.

(*See* Plan 12.)

The three towns of Bremerhaven, Lehe, and Geestemunde, though separately administered, are really one.

The principal objection to their unification is the fact that the first belongs to the Hansa town *Bremen* and the two others to *Prussia*.

Area.

The town of *Bremerhaven* covers a little over half a square mile (330 acres), but the territory belonging to it a little over 2 square miles.

The town of *Lehe* is slightly bigger, its area being 360 acres.

Geestemunde, the smallest of the three towns, covers an area of some 295 acres.

Population.

The total population of the three towns was about 85,000 in 1914, of which some 28,000 lived in Bremerhaven, 32,000 in Lehe, and 25,000 in Geestemunde.

Buildings and Hospitals.

BREMERHAVEN.

The *Central Railway Depot* is near the north corner of the *Alter Hafen* and 50 yards N. of it is the principal *Post Office* and some 400 yards beyond that, in a N.N.W. direction, is the principal *Fire Station*.

Due north of the Railway Depot, 550 yards, is a large *College* (Gymnasium).

N. b. E. of the Railway Depot, about 680 yards, is the *Municipal Hospital*, and 120 yards beyond this is a very large *School*. West of this school stands *St. Joseph's Hospital*.

N.E. b. N. of the Railway Depot, about 450 yards, is the *Methodist Chapel*.

N.E. b. E., 280 yards from the Depot stands the *Lutheran Church* (Kreuz Kirche) and across the street to the westward is the *Roman Catholic Church*.

300 yards east of the Depot the *Evangelical Church* stands in the centre of a square planted with trees. Its fretted tower, 256 feet high, is a conspicuous landmark.

In the same direction, but 250 yards further on, is the *Old Theatre*, which stands in the *Volks Garten*, a small park on the right bank of the *Geeste River*.

S.E., $\frac{3}{4}$ mile from the Railway Depot, is the *Market place* and 170 yards south of this are the local *Law Courts*, which stand in a small park. To the westward of the Market is the *New Theatre*.

Across the road to the eastward from the Law Courts is a large *Brewery*.

75 yards southwest of the Railway Depot is the *Engine House* for the Harbour Railways.

The *W/T Station* is about 400 yards W. b. N. of the Railway Station and is just N. of the *Neue Schleuse*.

GEESTEMUNDE.

Close to the southeast corner of the *Holz Hafen* the *Old Evangelical Church* stands in grounds planted with trees.

A large *Electric Power Station* is 230 yards, a large *Secondary School* 500 yards, and the town *Gasworks* 800 yards, N. b. W. of this Church.

The *Apostolic Church* is 600 yards north of the Old Evangelical Church.

There is a park, called the *Burger Park*, east of the Apostolic Church. It covers an area of about 140 acres. There is a large *Municipal Hospital*, 650 yards E. b. S. of the Old Evangelical Church, and 350 yards south of the Hospital is the *Workhouse*.

A *Dairy* and *Mill* stand on the outskirts of the town 570 yards S. b. E. of this Church.

The *New Market Place* (area about $2\frac{3}{4}$ acres), is 550 yards south of the Church.

On the north side of the Market is a *School* and at its southeast corner is the *Municipal Water Tower*.

Near its south by west corner is the *New Evangelical Church*, close to which is a *School* and a *Gymnasium*.

The *Geestemünde Goods Station* of the State Railway is 775 yards southwest of the Old Evangelical Church, the *Engine-house* being 720 yards S.S.E. of the station.

The *Post Office* is 550 yards W.S.W. of the Old Evangelical Church, and at the northwest corner of the same block of buildings, on the quay of the *Haupt Kanal*, stands the *Head Customs Office*.

The *Landrath's (Prefect's) Office* is close by the junction of the *Haupt* and *Quer Kanals*, close behind the *Mine Store* (see "MINE DEPOT," page 20), 500 yards west of the Old Evangelical Church.

The local *Law Courts* and *Prison* are 525 yards northwest of the Church, not far from the head of the *Quer Kanal*, and actually at the head of this Canal are the *Fleet Magazines*.

West of the Prefecture and north of the centre of the *Haupt Kanal* is the *Old Market Place* (area 1½ acres).

Another *Electric Power House* is 170 yards S.S.E. of the head of the *Fischerei Hafen*, and a *Tramway Depot* is N.E. b. E., 300 yards from the Power House.

LEHE.

The principal church of Lehe is the *Evangelical Church* which stands on the northeast side of the *Old Market Place* almost exactly 1 statute mile N.N.E. of the Central Railway Depot of Bremerhaven.

Schwonn & Co. have *waterworks* on the east and north sides of this Church.

The principal *Fire Station* is 300 yards S. b. E. of the Evangelical Church.

The *Baptist Chapel* is 880 yards S.S.W. from the Church, i. e., at the extreme southwestern corner of the town.

There is a large *Goods Station*, 750 yards southwest of the Church.

W. b. S. of the Church there are three *Schools*, 70, 170, and 300 yards distant, respectively.

W. b. N., 170 yards from the Evangelical Church, is the *Technical School*.

There is a big *Electrical Power Station*, 900 yards N. b. W. of this Church.

The *Post Office* and the *New Market Place* (2¼ acres) are 270 and 950 yards due north of the Church, respectively, and just to the eastward of the Post Office are some Public Gardens known as the "*Englischer Garten*."

The local *Law Courts* and *Prison* and the *Roman Catholic Church* are 800 and 1,120 yards, respectively, N.N.E. of the Evangelical Church.

The *Lehe Railway Station* is 1,325 yards northeast of this Church and 250 yards S. b. E. of the Station are the *Gasworks*.

The *Barracks* for the III. Division of the *Matrosen-Artillerie* are 350 yards E.N.E. of the Evangelical Church, and half-way between the Barracks and the Gasworks is the *Military Hospital*. There is a low power W/T station on the roof of the Barracks.

In front (southward) of the Barracks is a *Drill Ground* (4¼ acres).

Outside the town and about 900 yards north of the Roman Catholic Church is the *Paupers' Hospital*, another *Tramway Depot* being 225 yards north of this.

Three-quarters of a mile north of the Tramway Depot there is a large public park called *Speckenbüttel Park*.

In this Park there are race tracks for horses and bicycles, a skating pond, shooting gallery, restaurant, &c.

The *Water Tower* for the Bremerhaven water supply is 400 yards E. b. S. of the Tramway Depot.

Lighting and Power.

Apparently all three towns are lit by both gas and electricity, the gasworks being in the following positions.

BREMERHAVEN.

300 yards S.E. of the Head of *Kaiser Hafen II*.

GEESTEMÜNDE.

225 yards east of *Seebeck No. 2 Dock* (see page 11).

LEHE.

250 yards S. b. E. of the *Railway Station*.

The *Electric Light and Power Works* are as follows (see page 11):

BREMERHAVEN.

Light and power supplied by the Power House.

GEESTEMÜNDE.

North of the head of the *Holz Hafen*, about 100 yards and S.S.E. of the head of the *Fischerei Hafen*, 170 yards.

LEHE.

1,500 yards E. b. S. of the northeast corner of *Kaiser Hafen III*.

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Water.

It is not known which waterworks supply the different towns, but a *water tower* (for Bremerhaven) is known to exist near the north end of the town of Lehe, and a *waterworks* near the centre of the same town.

There is also a *water tower* at the southeast corner of the *New Market Place* in *Geestemünde*, south of the *Holz Hafen*.

Internal Communications.

TRAMWAYS.

There is an electric tramway which connects the head of the *Fischerei Hafen* in *Geestemünde* with the *Quarantine Station* on the southeast side of the *Kaiser Hafen II* in *Bremerhaven*.

In *Geestemünde* there are three branch tramways, one past the *New Market* to the *Municipal Hospital*, one from the *Haupt Kanal* bridge to the *Goods Railway Station*, and the third from the *Geeste Bridge* toward the *Bürger Park* and the *New Railway Station*.

In *Bremerhaven* there is a branch line from the *Quarantine Station* to the eastward.

At present this branch is only ¼ mile long, but it is about to be extended as far as the main line of the *Lehe* tramway, with which it will connect at the *Lehe Post Office*.

There are three other branch tramways; one past the *Market Place* to *Custom's Branch Office* (*Zollstrasse*), another from *Custom's Branch Office* to the *Lloyd Cantine*, and the last from the *Custom's Branch Office* to the *Lehe Post Office* via *Rickmers Strasse*.

The *Bremerhaven, Lehe*, and *Speckenbüttel* tramway was, until very recently, a horse tramway, but it has been converted to an electric service.

This line extends from the Bremerhaven *Central Railway Depot* in a northeasterly direction past the *Methodist Chapel* (where it enters the town of Lehe) up the main street (*Hafen Strasse*) of Lehe, past the *Evangelical Church* and the *post office*, then past the *Law Courts* and *prison* and the *Roman Catholic Church*, and on to a point near the southern end of the *Speckenbüttel Park*.

There is a short branch of this line from close to the southwestward of the *Law Courts* to the *Lehe Railway Station*.

RAILWAYS.

There are many railways in the towns, but the stations are few.

They are described on pages —, —, under the heading "BUILDINGS AND HOSPITALS."

FERRIES.

The local ferries are described on page —, under the heading "COMMERCIAL PORT—COMMUNICATIONS," but, in addition to these, motor boats ply on the *Geeste River*, itinerary not known.

COMMUNICATIONS.

Steamship Services.

This port is the headquarters of the *Norddeutscher Lloyd*, though nominally it is at *Bremen*. It has become the custom to include the sailings of all vessels from Bremerhaven under those from *Bremen*, and all statistics are made up as though the latter were the only port.

Details will therefore be found under *Bremen* (see pages 35, 36). Besides the main steamship lines there are the following local lines:

| Company. | Name. | Length. | Breadth. | Draft. | Tonnage, gross. | H. P. | Speed. | Propulsion and funnels. | Passengers. | Itinerary. |
|----------|--------------|--------------|--------------|--------------|-----------------|-------|---------------|-------------------------|-------------|---|
| | | <i>Feet.</i> | <i>Feet.</i> | <i>Feet.</i> | <i>Tons.</i> | | <i>Knots.</i> | | <i>No.</i> | |
| N. D. L. | Nixe..... | 246 | 30¼ | 7 | 840 | 2,180 | 16½ | Pad. 2 | 575 | From the Strandhalle and the Lloyd Halle, Bremerhaven-Helgoland (in connection with H. A. L. service Helgoland-Sylt-Amrum-Föhr)-Norderney. Three times weekly. Daily from June to September. "Seeadler" calls at Wilhelmshaven four times weekly in summer. |
| | Najade.... | 230 | 28¼ | 6¼ | 725 | 1,620 | 15½ | Pad. 1 | 500 | |
| | Seeadler.... | ? | ? | ? | 535 | 950 | 16 | Tw. Sc. 2 | 460 | |
| | Delphin.... | ? | ? | ? | 380 | 880 | ? | Pad. 1 | ? | |
| | Lachs..... | ? | ? | ? | 270 | 550 | ? | ? | 220 | |
| | Gluckauf.. | ? | ? | ? | ? | ? | ? | ? | ? | |
| | ? | | | | | | | Sc. | ? | Used occasionally for trips to various islands in summer. Is a passenger and mail tender. |
| | ? | | | | | | | ? | ? | Bremen. Twice daily in summer, calling at Vegesack, Brake, and Nordenham. |
| ? | Ferries..... | | | | | | | ? | ? | Blexen, Nordenham. Ten times daily, i. e., every 55 minutes, in summer. ? in winter. |

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Railways.

Bremerhaven is connected by rail with—

- (1) S. to *Bremen*.
- (2) S. E. to *Bremerwürde* and *Stade*.
- (3) N. E. to *Bederkesa*, and
- (4) N. to *Cuxhaven*.

(1) From the *Lloyd Halle* passenger station to *Geestemünde*, 3 $\frac{3}{4}$ miles*; then in a S. E. direction through *Wulsdorf*, 5 $\frac{1}{4}$ miles ((2) branches E. here); *Loxstedt*, 8 $\frac{1}{4}$ miles; *Freschluneberg*, 12 $\frac{1}{2}$ miles; to *Stubben*, 16 $\frac{1}{4}$ miles; then S. to *Lübberstedt*, 20 $\frac{1}{4}$ miles; S. b. E. to *Oldenbüttel*, 24 $\frac{3}{8}$ miles; S. to *Osterholz-Scharmbeck*, 28 $\frac{3}{8}$ miles; S. W. through *Ritterhude*, 32 miles; to *Lesum*, 34 $\frac{3}{8}$ miles; S. E. through *Oslshausen*, 37 $\frac{1}{4}$ miles; to *Bremen* (Haupt Bahnhof), 41 $\frac{3}{8}$ miles.

(2) From *Wulsdorf*, 5 $\frac{1}{4}$ miles (see (1)); E. through *Sellstedt*, 10 $\frac{3}{8}$ miles; to *Wehdel*, 14 miles; E. b. S. through *Geestenseth*, 17 miles; *Frelsdorf*, 19 $\frac{1}{4}$ miles; *Hingel*, 22 $\frac{1}{2}$ miles; to *Örel*, 25 $\frac{1}{2}$ miles; thence E. by E. b. S. to *Bremerwürde*, 28 $\frac{3}{8}$ miles; E. N. E. and N. E. to *Stade*, 48 $\frac{1}{2}$ miles.

(3) From *Speckenbüttel*, 7 $\frac{3}{8}$ miles (see (4)); N. to *Langen*, 8 $\frac{1}{4}$ miles; N. E. and E. N. E. to *Debstedterbüttel*, 11 miles; E. N. E. and E. to *Drangstedt*, 14 $\frac{3}{8}$ miles; E. N. E. to *Bederkesa*, 18 $\frac{1}{8}$ miles.

(4) From the *Lloyd Halle* to *Lehe*, 5 $\frac{1}{2}$ miles; N. to *Speckenbüttel*, 7 $\frac{3}{8}$ miles ((3) branches N. here); N. W. to *Imsum*, 10 $\frac{3}{8}$ miles; N. N. W. to *Wremen*, 12 $\frac{3}{8}$ miles; N. E. to *Mulsum*, 14 $\frac{1}{4}$ miles; N. N. E. to *Dorum*, 16 $\frac{1}{2}$ miles; N. to *Cappel*, 19 $\frac{3}{8}$ miles; N. b. E. to *Kvill* (Spieka), 21 $\frac{1}{2}$ miles; N. N. E. through *Nordholz*, 23 miles; to *Altenwalde*, 26 $\frac{7}{8}$ miles; then N. N. E., N., N. W. to *Cuxhaven*, 31 miles.

The towns of Bremerhaven and Geestemünde are intersected by railway tracks in all directions, whereas Lehe has tracks to the E. and W. of it, but none through it.

Bremerhaven has one railway station, besides the *Central Railway Depot* and the *Lloyd Halle Station* (see page 17).

Geestemünde has four stations, the *New Station*, the *Goods Stations*, and the *Fischerei Hafen Station*. The latter is mainly a goods station for the fisheries, but there is passenger accommodation also.

The new passenger and goods station is to the eastward of the town, near the Municipal Hospital.

At Lehe there are two stations, the *Zollinland Station* and the *Lehe Station* (see page 16). The former is mainly a goods station, but it would appear that there must be some passenger accommodation, since the local time tables show that a few passenger trains stop there.

Roads. (See Maps 8 and 8A.)

There are six main roads which radiate from the towns of Geestemünde and Lehe (Bremerhaven being practically surrounded on the landward side by these towns) from the southward through E. to the northward.

(A.) From the *Road Bridge* over the *Geeste River* S. through *Wulsdorf*, 1 $\frac{3}{8}$ miles† (here (B.) S. E. b. E.); to *Stotel*, 6 $\frac{1}{8}$ miles (here branch (Y.) N. E. also (A.†) (see below)); then S. b. E. through *Börsten*, 13 $\frac{1}{2}$ miles (here (Z.) crosses); to *Garlstedt*, 19 $\frac{1}{2}$ miles; S. through *Heilshorn*, 23 miles; to *Burg-Lesum*, 28 $\frac{1}{2}$ miles (here crosses *Lesu River* and (A.†) rejoins from W.); S. E. through *Oslshausen*, 30 $\frac{1}{2}$ miles; and *Gropelingen*, 32 miles; to *Bremen*, 35 $\frac{1}{2}$ miles.

(A.†) From *Stotel* (see (A.)); S. W. and W. to *Büttel*, 9 $\frac{1}{4}$ miles; (W. $\frac{1}{2}$ mile) through *Sandstedt*, 15 $\frac{1}{2}$ miles (at 19 $\frac{3}{8}$ miles (Z.) joins); *Neuenkirchen*, 26 $\frac{1}{4}$ miles; to *Bekum*, 27 $\frac{1}{2}$ miles; S. E. through *Blumenthal*, 31 $\frac{3}{8}$ miles; to *Vegesack*, 33 $\frac{3}{8}$ miles; E. to *Burg-Lesum*, 37 $\frac{1}{4}$ miles, where road (A.) is rejoined.

(B.) From *Wulsdorf* (see (A.)) E. S. E. (at 5 $\frac{3}{8}$ miles (Y.) crosses) through *Heerstedt*, 8 $\frac{7}{8}$ miles, to *Beverstedt*, 13 $\frac{1}{4}$ miles (meets (Z.) here) E. b. S. to *Kirschwistedt*, 16 $\frac{3}{8}$ miles, E. b. N. to *Volkmarkt*, 18 $\frac{7}{8}$ miles, N. E. to *Örel*, 26 miles, thence E. N. E. and N. E. to *Bremervörde*, 3 $\frac{1}{2}$ miles.

(Z.) From junction with (A.†) at *Rechlehe* E. b. N., 1 $\frac{1}{2}$ miles to *Uthlede*; then N. E. 4 miles to *Hagen*; E. N. E., 1 $\frac{3}{8}$ miles to *Börsten* (here crosses (A.)); N. E., 4 $\frac{1}{2}$ miles to *Bokel*; N. N. E. and N. E., 3 $\frac{3}{8}$ miles to *Beverstedt* (crosses (B.) here); N. N. E., 3 $\frac{3}{8}$ miles to *Wollingst*; N. b. E., N. N. W., and N. N. E., 5 $\frac{1}{2}$ miles to *Köhlen* (road (C.) joins half-way along this stretch); N. b. E., and N., 2 $\frac{3}{8}$ miles, to *Hainmühlen*; N. W. and N., 3 $\frac{3}{8}$ miles to *Bederkesa* (see (D.†)); thence N. b. E., 9 miles to *Ihlienworth* and N. b. W. 3 $\frac{1}{2}$ miles to *Neuenkirchen*, where it meets (D.).

(Y.) From its junction with (A.) N. E. 2 miles to *Loxstedt*; N. E. b. E. (crosses (B.)) 3 miles to *Donnern*; N. b. E. 2 $\frac{1}{4}$ miles to *Sellstedt* (see (C.)).

* The distances are measured along the railway in statute miles from the *Lloyd Halle Station*.

† The distances are given from the road bridge joining Geestemünde and Bremerhaven in statute miles along the roads (A.), (A.†), (B.), (C.), (C.†), (D.), (D.†), (E.), (F.), and (F.†). On roads (X.), (Y.), and (Z.) they are given, also in statute miles, along each stretch separately.

(C.) From the *Geeste River Road Bridge* E. to *Schiffdorf*, 4 $\frac{1}{2}$ miles; S.E. and E. b. N. to *Sellstedt*, 7 $\frac{3}{8}$ miles (see (Y.)); E.S.E. and E. to *Wehdel*, 10 $\frac{1}{2}$ miles; E. b. N. and E. b. S. to *Geestenseth*, 12 $\frac{3}{8}$ miles (meets (Z.) here).

(C.†) From *Schiffdorf* (see (C.)) N.E. through *Bramel* to *Marschkamp*, 9 miles; from here a third-class road E. and N. to *Elmlohe*, 10 $\frac{3}{8}$ miles; then first-class road N. b. E. to *Drangstedt*, 12 $\frac{1}{2}$ miles (see (D.†)).

(D.) From the *Geeste Road bridge* to the northward through *Bremerhaven* and *Lehe* to *Speckenbüttel*, 3 $\frac{3}{8}$ miles; N. to *Langen*, 5 $\frac{1}{4}$ miles; N.E. to *Debstedt*, 7 $\frac{3}{8}$ miles (here (D.†) branches E.); N.N.E. to *Neuenwalde*, 12 $\frac{3}{8}$ miles (here (X.) crosses); N. to *Krempel*, 14 $\frac{1}{2}$ miles; N.E. through *Westerwanna* to *Osterwanna*, 19 $\frac{1}{2}$ miles; N.N.E. to *Nordleda*, 21 $\frac{1}{4}$ miles; N.E.E. to *Neuenkirchen*, 23 $\frac{7}{8}$ miles (here (Z.) joins); N. b. E. to *Otterndorf*, 25 $\frac{3}{8}$ miles.

(D.†) From *Debstedt* (see (D.)) E. b. S. to *Drangstedt*, 12 $\frac{3}{8}$ miles (see (C.†)); E. b. N. to junction with (X.), 15 $\frac{1}{8}$ miles; and to *Bederkesa*, 16 $\frac{3}{8}$ miles (see (Z.)).

(E.) From *Langen* (see (D.)); N through *Sievern*, 8 $\frac{3}{8}$ miles; to *Holssel*, 11 miles; crossing (X.) $\frac{1}{2}$ mile short of this place.

(F.) From *Speckenbüttel* (see (D.)), W.N.W. to *Weddewarden*, 8 miles; from here the road zigzags N.N.E. and W.N.W. in short stretches as far as *Wremen*, 12 $\frac{7}{8}$ miles; thence N.N.E. through *Dorum*, 16 $\frac{1}{2}$ miles (crosses (X.) here); *Midlum*, 20 $\frac{3}{8}$ miles; *Altenwalde*, 27 miles, to *Cuxhaven*, 30 miles.

(F.†) From its junction with (F.) at 14 miles; along the coast at an average distance of one mile from the high-water line (dyke) to its junction with (X.), 19 $\frac{1}{2}$ miles; thence in a north-north-easterly direction, about 1 $\frac{3}{8}$ miles from the coast dyke, to *Nordholz*, 24 $\frac{3}{8}$ miles.

(X.) From *Bederkesa* (see (Z.) and (D.)), W. b. S. and W.N.W., 2 $\frac{7}{8}$ miles, to *Fickmühlen*; N.W. and W.N.W., 4 $\frac{3}{8}$ miles, to *Neuenwalde* (see (D.)); W. b. N., 3 miles, to road (E.); W. b. S., N.W. and W. b. S., 2 $\frac{1}{4}$ miles to *Dorum* (crosses (F.) here); N. b. W., 2 $\frac{3}{8}$ miles, to junction with (F.†).

Road Services.

The Lehe tramway follows road (D.) as far as *Speckenbüttel*.

The following road services were formerly carried out by stage coach, but it is probable that these vehicles have since been replaced by motor coaches and the services extended:

| From— | To— | Route. | Distance. | Time. | Frequency of service. |
|-------------------------------|-------------------------------------|---------------------------------------|--|--|--|
| Geestemünde Rail-way Station. | Hagen..... | Roads. (A.) and (Z.) | Miles. 15 | Hours. 3 $\frac{3}{4}$ | Once each way daily in summer season, at other times three times weekly. Twice daily in summer, ? at other times. |
| Lehe, Old Market.... | Neuenwalde (return via Holssel). | (D.), return via (X.) and (E.). | 12 $\frac{3}{8}$ return 13 $\frac{1}{2}$ | 3 $\frac{1}{4}$ return 3 $\frac{1}{4}$ | |

Cables.

There is one cable from *Wilhelmshaven* to Bremerhaven, which comes via *Hohe Weg Lighthouse* and *Meyers Legde Lighthouse*.

Its landing place at Bremerhaven is not known.

Telegraph and Telephone.

The telegraph stations are at the post offices, the positions of which will be found on pages 15, 16 in the description of the towns. They are connected with the main systems of the Empire.

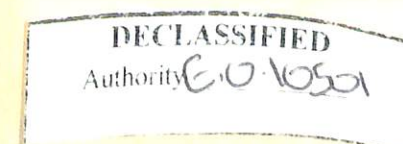
The positions of the telephone exchanges are not known, but the three towns are in connection with the main telephone system of the Empire.

Canals.

The *Geeste River* has been canalised for a distance of 12 $\frac{1}{2}$ miles from its confluence with the *Weser*, and has one lock 5 $\frac{3}{8}$ miles above this confluence.

From the head of the canalisation a canal has been cut via *Bederkesa* to *Otterndorf* on the *Elbe*.

This canal has two locks, one of which is 1 $\frac{1}{2}$ miles S.S.E. of *Bederkesa* and the other is at the entrance from the *Elbe*, about 1 mile north of *Otterndorf*.



GEESTE-OTTERNDORF CANAL, useful dimensions:

| Locks. | | | | Bridges. | | | | Shoalest part of sand. | | Remarks. |
|--|------------------------|----------|------------------|----------|----------|------------------------|------------------------|------------------------|--|--|
| No. | Length. | Breadth. | Depth over sill. | Road. | Railway. | Width of opening. | Head room. | Depth. | Position. | |
| 3* | Feet. 63 $\frac{3}{8}$ | Feet. 20 | Feet. 12 | No. 16 | No. 2 | Feet. 16 $\frac{1}{2}$ | Feet. 14 $\frac{2}{3}$ | Feet. 4 $\frac{1}{4}$ | 1 $\frac{1}{2}$ miles E.S.E. of Steinau. | The bridges are fixed, with the exception of the one over the shoalest part. |
| Total length of canal Geestemünde to Otterndorf, 42 $\frac{1}{2}$ statute miles. | | | | | | | | | | |

*The canalised Geeste River is included in this table.

Wireless Telegraphy.

There is a W/T station on the North side of the *Neue Schleuse* at Bremerhaven and there is another close to the Lloyd Halle. There is also a low power station at the Lehe Barracks.

THE NAVAL PORT.

General.

There is no base for big ships at Bremerhaven, though these are occasionally docked and coaled at this port.

For details of docks and coaling arrangements, see under these headings, under "COMMERCIAL PORT," pages 11, 12.

Destroyer Base and Submarine Depôt.

The Imperial Navy has three large oil tanks and a few small ones believed to be those behind the goods sheds on the E. side of the *Kaiser Hafen I.* opposite the *Kleine Kaiser Schleuse*. Destroyers and submarines call here occasionally to take in fuel.

Mining Depôt.

POSITION.

There is a large mining depôt on the Western quay of the *Quer Kanal* occupying about $\frac{1}{4}$ of its length near the southern end.

BUILDINGS.

There are two buildings 270 and 250 feet long, in which mines and mining gear are stored.

VESSELS.

Lying alongside these store-houses four small steamers, like tugs, and a large lighter have been seen.

It is reported that there are altogether eight vessels belonging to the mining flotilla based on Geestemünde.

The steamers were painted, hull black, upper works grey, and they had large hatches aft, but no special fittings were noticeable, except bullet-proof shelters round the steering positions and a small Q.F. gun mounted aft.

The large lighter had the appearance of being used, probably, as a floating mine store for use with the steamers.

Aerial Base.

No aerial base exists at Bremerhaven, the nearest being that near *Kappel*, about half way to Cuxhaven (on road (F.)), see page 19), for details of which see under "CUXHAVEN" (section 4).

War Material.

COAL.

The following stocks of coal are kept under contract with the Imperial Navy:

| Firm. | Amount. | Position of store. |
|---------------------------|-------------|-------------------------------|
| Tieck and Garrels..... | Tons. 1,000 | ? |
| Claussen and Wieting..... | 4,000 | S. W. corner, Kaiser Hafen I. |
| Schwarting and Beyer..... | 1,000 | ? |

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The Government does not keep any stock of its own, but depends on private firms. For details of other stocks kept, see page 12.

OIL.

Information on this subject will be found under the heading "DESTROYER BASE AND SUBMARINE DEPÔT," above. It is not known how much oil is kept in the tanks.

STORES.

A brick and steel storehouse was built for the Imperial Navy on the quay of the *Kaiser Hafen I.*, between the *Grosse* and *Kleine Kaiser Schleuse*, in February, 1914. This is the first naval building on the quays of the *Kaiser Hafen*.

It is 80 feet square and 18 feet high and has no windows, but eight skylights, floor of concrete, three sets of double sliding doors facing the harbour.

Only officers and seamen are allowed to enter this building, and it is suggested that naval stores of some description are kept therein.

The fact that some torpedo nets were seen being landed at this storehouse lends colour to this suggestion.

GUNS.

The N.D.L. have a large number of guns in store in a large shed on one of the quays of the *Kaiser Hafen* (? W. side).

The shed is marked "Schiffskammer (K.) No. I.—XII." and contained, in June, 1914, guns on one side and mountings on the other. It is provided with lightning conductors.

A special staff is kept to clean and maintain the guns and mountings, of which the following were seen:

| | |
|--------------------------------|----------|
| 15 cm. (5.9-in.)..... | 40 |
| 105 mm. (4.1-in.)..... | 40 to 50 |
| 88 mm. (3.5-in.) Q.F..... | Some. |
| 37 mm. (1.45-in.) machine..... | Some. |

No ammunition was seen, but it is known that some powder was stored in one of these sheds.

The staff are exercised in mounting guns on board N.D.L. ships every six months, and at the last practice reported in 1914 they mounted 10 guns, size not stated, in six hours. The further "clearing for action" of the ship, in this case the "Berlin," would take one or two days.

The ships of the N.D.L. have no special magazines, but would probably adapt part of the cold-storage rooms or mail room.

FLEET MAGAZINES.

At the head of the *Quer Kanal* there are some buildings known as the "Marine Artillerie Depôt."

It is believed that these contain ammunition for the fleet.

In connection with this depôt there are two small workshops; one is apparently a carpenters' shop and the other contains some machinery, the nature of which is unknown.

MINES.

See under "MINING DEPÔT," page 20.

Naval Details.

FLEET PERSONNEL ON SHORE.

The "Marine Artillerie Depôt" is commanded by a Kapitän-zur-See, who also has charge of the *Naval Store* in Kaiser Hafen I.

This officer has 3 Kapt. Leutenants, 1 Ober Leutnant, and 2 Leutenants (all Feuerwerks) under his command, but the number of men is unknown.

The *Mine Depôt* is commanded by the same Kapitän-zur-See and he has 2 Torp. Kapt. Leutenants and 1 Leutnant under his command, number of men unknown.

BARRACKS AND NAVAL HOSPITAL.

The *Barracks* of the III. Matrosen Artillerie is in Lehe, as also is the *Naval and Military Hospital* (see page 16). No details are known of these buildings.

SCHOOLS AND TRAINING ESTABLISHMENTS.

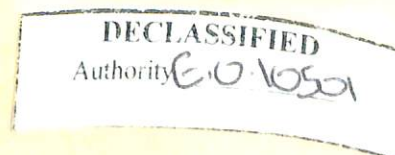
There is a school for *Naval Telegraphists* just to the northward of the barracks at Lehe, and these barracks have a low-power W/T installation.

RIFLE RANGE.

A rifle range is mentioned in one report, but its position is unknown.

There are rifle ranges in the *Speckenbüttel Park* and the Geestemünde *Bürger Park*, but both of these are only 218 yards long and are used mainly for amusement.

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NAVAL USES OF THE PORT.

Ships of the high sea fleet use this port both for coaling and dry-docking, but it has not been reported that any repairs have been undertaken, though some of the private ship-building firms are quite capable of so doing (see pages 13-15).

Army Details.

GARRISON.

There is no permanent garrison (beyond 3 companies of the Matrosen Artillerie) at Bremerhaven in peace, but there is little doubt that in war one or all of the three towns would be used as a center for the concentration of troops for the defence of the surrounding districts.

Defences.

The defences of Bremerhaven are described in section 2, under the heading "DEFENCES OF JADE AND WESER."

WESER RIVER.

(See map 8A.)

BREMERHAVEN TO BREMEN.

Depths.

Owing to extensive measures which have been taken during the last 40 years for the regulation of the Weser, the main channel has been considerably deepened.

At average high water vessels drawing 30 feet can reach *Nordenham* (5 nautical miles above Bremerhaven), 26 feet *Brake* (14 nautical miles above Bremerhaven), 24 feet *Vegeack* (26½ nautical miles above Bremerhaven), and 19½ feet *Bremen* (33½ nautical miles above Bremerhaven).

Vessels drawing as much as 21½ feet have reached *Bremen*, however, on spring tides with a northwesterly wind.

When the Weser is in flood the tides have reached as much as 4 feet above M.H.W.S.

The river is, however, to be deepened so that vessels drawing 26 feet can reach *Bremen* at high water, and the channels are to be standardized in width, *i. e.*, from *Bremerhaven* to *Brake* not less than 328 feet wide and thence to *Bremen* not less than 197 feet wide, at *Bremen* not less than 492 feet wide.

Ice.

Ice appears on the Weser on an average 20 days per annum at *Bremerhaven*, 19 days at *Brake*, and 13 days at *Bremen*.

The ice usually appears between the end of November and the end of February, and never interferes with big ship navigation as far up as *Nordenham*, though lightly built vessels would be compelled to proceed at a slow speed, as the floes are frequently large.

For the reaches above *Nordenham* the city of *Bremen* maintains some ice breakers.

Beacons mark the distance along the channel every half kilometer, starting from the *Kaiser Brücke* at *Bremen*.

The excellent lighting of the Weser now allows vessels to come up to *Bremen* at night.

BLEXEN.

(See also section 2.)

General Description.

This is a small fishing town on the eastern extremity of *Butjadinger Land* (see section 2), about 2 nautical miles above *Bremerhaven* on the *Weser River*.

Its claims to attention are that it is the terminus of the Oldenburg State Railway, and of the ferries from *Geestemünde*, that there is here a large store of oil belonging to the *Asiatic Petroleum Co.* and the small shipbuilding and repairing establishments.

At *Blexersand*, about 1¼ miles to the southward, the *Metallwerke Unterweser*, a small ironworks, have a wharf, and *Frerichs & Co.*, shipbuilders and repairers, have another just to the northward of this, at *Einswarden*.

Quayage.

The *Petroleum Co.'s Wharf* has a depth of 23½ feet alongside at M.L.W.S. and is 200 feet long.

The so-called *Hafen* is a small open basin 280 feet long and 88½ feet wide. It has quays on both sides, alongside of which there is 8½ to 5 feet of water at M.H.W.S.

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The *Blexersand Ironworks Wharf* is 656 feet long, and there are 24 feet of water at M. L. W. S. (36½ feet at M. H. W. S.) alongside.

The *Frerichs Wharf* is about 200 feet long and has a depth of 26½ feet M. L. W. S. (39 feet M. H. W. S.) alongside.

There are also some small piers used by the ferryboats.

Lifting Appliances.

The *Metallwerke Unterweser* have some cranes on their wharf, but nothing is known as to their capabilities or power.

Slips and Building Capacity.

Six building slips were projected for *Frerichs Yard*, size not known, but no report as to their progress has been received and the firm was said to be closing down and offering the yard for sale. A later report has been received, however, to the effect that the yard is executing some small orders for the Imperial Navy.

Docks and Repair Capacity.

There are no docks, but there are three patent slips.

| Name. | Takes ships up to | | Remarks. |
|------------|-------------------|---------------|---|
| | Length. | Tonnage. | |
| | <i>Feet.</i> | <i>Gross.</i> | |
| No. 1..... | 170½ | 400 | } The slips are served by electric Broadside. } winches. |
| No. 2..... | 170½ | 400 | |
| No. 3..... | 180½ | 600 | |

It is reported that the slips can be combined to take vessels up to 2,500 tons gross.

Machine Shops.

Near the slipways there is a large repairing shop, and other machine and workshops are in the vicinity.

Communications.

BY SEA.

The ferries from *Geestemünde* call at Blexen on their way to and from *Nordenham*, and the *Bremen-Bremerhaven* steamers also call here on their down-river trips.

BY LAND.

Blexen is the terminus of the *Oldenburg State Railway*, and there are branches of this railway to the *Metallwerke Unterweser* and the *Frerichs Yard*.

ROADS.

The roads are described under the heading "Butjadinger Land," section 2.

TELEGRAPHS AND TELEPHONES.

There is telegraphic and telephonic connection with the main systems of the Empire.

FUELS.

There are no stocks of coal kept at Blexen, but at *Blexersand* the *Metallwerke Unterweser* keep a large stock.

The *Asiatic Petroleum Co.* have four large storage tanks for oil and several small ones.

NORDENHAM.

(See Plate 3.)

This town, on the left bank of the *Weser*, about 5 nautical miles above *Bremerhaven*, had lost its importance, but is beginning to develop into a commercial and fishing port.

At one time the larger steamers of the N. D. L. used this port as their terminus, and most of the small steamers called there on their way to *Bremen*.

Since the development of *Bremerhaven* and the deepening of the *Weser* the larger ships of the N. D. L. stop at *Bremerhaven* and the smaller vessels go right on to *Bremen* or *Brake*.

The N. D. L. wharves have now been taken over by the *Midgard Shipping Co.* of *Bremen*, who are using them for cargo traffic.

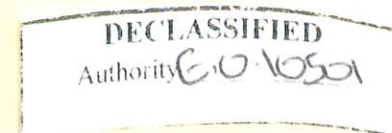
Port.

PIERS.

The *Midgard Co.* own the great pier 3,120 feet long, a steel structure parallel to the river bank, with a depth of 25 to 35 feet M. L. W. S. (36½ to 46½ feet M. H. W. S.) alongside, which has three railway tracks on it.

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The Deutsch-Amerikanischer Petroleumgesellschaft and Norddeutscher Seekabelwerke also have piers here, the former to the southward and the latter to the northward of the Midgard Pier.

There is a small pier just above the Midgard Pier which is used by ferries from *Geestemünde*.

BASINS.

There are two basins, the Fischerei Hafen and the Nöll Hafen.

The *Fischerei Hafen* is an irregularly shaped basin, the greatest length of which is 1,510 feet. It is 197 feet wide and is entered direct from the river by a canal about 500 feet long.

This basin is used almost entirely for the fishing trade, and there are 16 feet M. L. W. S. (27½ ft. M. H. W. S.) in it.

The so-called *Nöll Hafen* is only an indentation in the river bank and is very small and of no importance.

QUAYAGE.

All the quayage, both at the piers and in the basins, is tidal, and the springs rise is 11½ feet and that of the neaps 10¼ feet.

| Position. | Length. | Depth alongside, M. L. W. S. | Remarks. |
|----------------------|--------------|------------------------------|--|
| | <i>Feet.</i> | <i>Feet.</i> | |
| Midgard Pier..... | 3,118 | 25-35 | Iron wharf { 50 feet wide. 9½ feet from M. H. W. S. |
| Petroleum Pier..... | ? 70 | 24 | Iron wharf. |
| Seekabel Pier..... | 410 | 6½ | |
| Fischerei Hafen..... | 1,312 | 16½ | W. side } Stone quays. |
| Nöll Hafen..... | 1,444 | (28 feet M.H.W.S.) | E. side } |
| | 125 | 5 | S. side } Wood quay. |

LIFTING APPLIANCES.

Several electric cranes have been erected on the Midgard Pier, the number is unknown, but it is believed that their capacity is from 2 to 5 tons.

In addition to these there are three traveling steam cranes and two fixed hand cranes. The former lift 1½ and the latter 1 ton.

BUILDING AND REPAIR CAPACITY.

There are no slips or docks, though a dry dock was projected some years ago. This project does not appear to have matured, and, as far as is known, no building or repair works exist.

LIGHTING AND POWER.

All the piers and wharves are lit electrically, and the cranes are also worked by electricity. It is believed that the power is derived from the Wiesmoor Power Station near *Aurich* (see section 1).

Communications.

BY SEA.

There is irregular communication with the U. S. A. by oil steamers and to other countries by cargo steamers, but there are no regular sailings.

The *Geestemünde* ferries call at the Ferry Pier 10 times daily when the river is free from ice, the trip to *Geestemünde* occupying 45 to 50 minutes.

The *Bremen-Bremerhaven* steamers stop off here to pick up passengers (see page 17).

BY RAIL.

This port was, until 1905, the terminus of the Oldenburg State Railway, but in that year the line was opened as far as *Blexen* (see page 22).

The main line follows the left bank of the *Weser* as far as *Elsfleth* (see page 28), and then continues south to *Hude*, 27½ statute miles,* on the *Bremen-Oldenburg* line.

Branches of the main line serve both quays of the *Fischerei Hafen*, and there are three tracks on the *Midgard Pier*, which are connected at each end and at the middle of the pier with the main line.

There is a branch from this main line at *Brake*, 10½ miles to the southward (see page 27), which leads direct to *Oldenburg*, 30½ miles.

*The distances are given in statute miles along the railway, from Nordenham Station.

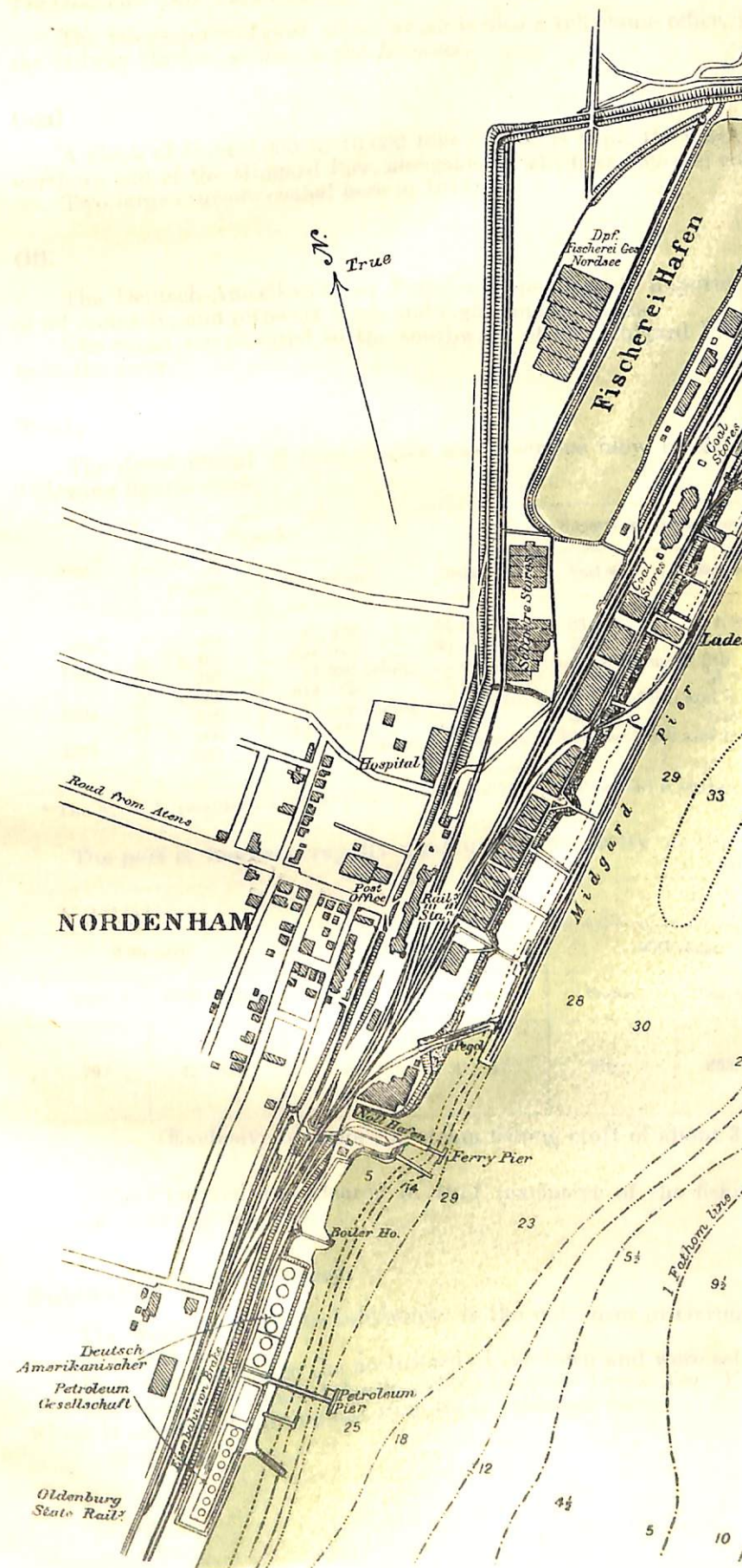
Pt. II, sec. 3.

NORDENHAM

SOUNDINGS IN FEET

Scale. 1:50,000

FEET 100 0 200 400



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The *Butjadinger Railway* strikes inland from Nordenham (see section 2) to *Stollhamm*, 6 miles, then north towards the coast at *Burhave*, 10¼ miles; thence follows the coast at an average distance of 1 mile through *Fedderwarden* (see section 2), 11¾ miles; *Langwarden*, 14 miles; *Tossens*, 17 miles; to *Eckwarder Hörn*, 2½ miles; whence ferries ply to *Wilhelms-haven*.

ROADS AND ROAD SERVICES.

The roads are described under "BUTJADINGER LAND" (see section 2).

In summer there is an omnibus service three to four times daily via *Abbehusen*, 3 miles; *Stollhamm*, 7 miles; *Wehl*, 11 miles; to *Eckwarder Hörn*, 14½ miles.

This service carries the mails for the inland villages.

The distances are given in statute miles along the roads.

TELEGRAPHS AND TELEPHONES.

The telegraph and post office, which is also a telephone office, is close to the northward of the railway station, as also is the *Hospital*.

Coal.

A stock of from 8,000 to 10,000 tons of coal is kept, the stacks and stores being near the northern end of the Midgard Pier, alongside of which vessels can coal.

Two large cruisers coaled here in 1913.

Oil.

The *Deutsch-Amerikanischer Petroleum gesellschaft* imports some 50,000 to 60,000 tons of oil annually, and owns six large and eight smaller tanks.

The tanks are situated to the southward of the Midgard Pier and are prominent objects from the river.

Trade.

The development of *Bremerhaven* was a serious blow to the trade of Nordenham, as the following figures show:

| Year. | Vessels. | | Imports and exports (tons). | | | | Total. |
|-------|----------|---|-----------------------------|-----------|------------|--------|---------|
| | Number. | Gross tonnage. | Grain. | Fuel oil. | Saltpetre. | Coal. | |
| 1889* | 394 | 82,375 | 55,506 | 23,806 | 1,863 | 2,338 | 83,513 |
| 1892 | 1,404 | 524,085 | 80,475 | 28,437 | 4,209 | 5,142 | 118,263 |
| | 297 | 14,950 fishing vessels with about 2,000 tons of fish. | | | | | |
| 1895 | 1,882 | 514,125 | 165,465 | 27,896 | 10,884 | 14,664 | 218,909 |
| | 380 | 17,800 fishing vessels with 2,985 tons of fish and ice. | | | | | |
| 1898 | 600 | 133,300 | 35,686 | 44,194 | 7,904 | 2,906 | 90,690 |
| | 647 | 34,563 fishing vessels with 5,510 tons of fish and ice. | | | | | |

* The N. D. L. established this as their terminus in 1890 and deserted it early in 1898.

The port is, however, rapidly regaining its prosperity, as the figures for 1911 show:

| Entered. | | | | Cleared. | | | |
|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| With cargo. | | In ballast. | | With cargo. | | In ballast. | |
| Vessels. | Gross tonnage. | Vessels. | Gross tonnage. | Vessels. | Gross tonnage. | Vessels. | Gross tonnage. |
| 797 | 427,836 | 67 | 47,347 | 210 | 263,994 | 586 | 112,069 |

(Exclusive of some 700 steam fishing craft of about 38,000 tons gross.)

A total entered and cleared in 1911 (exclusive of the fishing trade) of 1,660 vessels of 851,246 gross register tons.

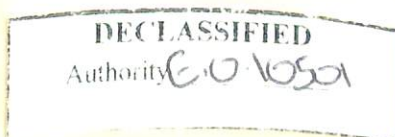
Submarine Cable Factory.

The *Norddeutscher Seekabelwerke* is the only firm in Germany which manufactures submarine cables.

Its works are just to the northward of the town and were established in 1901.

The second German Atlantic cable, *Borkum-Azores-New York*, was made by this firm, which is capable of turning out 19 miles of cable per diem.

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DEDESORF.

This is a small fishing village on the right bank of the *Weser*, about 7½ nautical miles above *Bremerhaven*.

Its trade is insignificant even in its staple industry, but it is noteworthy as the point at which two cables cross the river.

The points at which they cross are:

- (1) Due W. of the church,
- (2) 400 yards due north of (1),

and they reach points on the left bank due W. of these.

Immediately opposite *Dedesorf* and on the left bank *Kleinensiel*, a drainage sluice and from this point to *Nordenham* the railway runs close up to the river dyke.

BRAKE.

See Plate 4.

This is a small commercial port on the left bank of the *Weser*, about 14½ nautical miles above *Bremerhaven*.

Until the end of the 19th century it was the most important commercial port of the Grand Duchy of Oldenburg, but the rapid development of *Nordenham* relegated it to the second place, which it holds to this day.

Piers.

The town owns an iron pier 3,230 feet long, alongside of which there is 24¾ feet M. L. W. S. (35 feet M. H. W. S.) extending to the northward from the mouth of the basin lock.

There are also two or three small piers to the southward of the basin lock. The great pier has three railway tracks on it, which extend from the southern end to within 700 feet of the northern end.

These tracks are connected with the main line at two points at the southern end and also at one point at the northern end.

There are two grain elevators and several electric cranes (details unknown) on this pier.

Basins.

The basins are nontidal and are entered from the river through a small canal, called the *Vorhafen*, about 200 feet long; then through two pairs of dock gates about 40 feet apart. The outer gates open outwards and the inner ones inwards, the opening being 43½ feet wide and 19¾ feet deep at M. H. W. S.

The gates open on to the southern basin, which is about 950 feet long and 250 feet wide. It is of irregular shape and the sides slope on one side. The vertical quays are of stone.

This basin is 18 feet deep and is a "free area" for fiscal purposes; it is provided with electric and steam cranes.

The northern basin is also of irregular shape and is about 400 feet long, and varies in width from 125 feet to 100 feet.

It is 17½ feet deep and has a small basin, called the *Kielhol Hafen*, branching off from it in an easterly direction.

The *Kielhol Hafen* is 290 feet long, 121 feet wide, and 17½ feet deep. It is a "free area." Opening direct off the northern basin there is another basin, called the *Kanal Hafen*.

This basin is 17½ feet deep, 750 feet long, and 131¼ feet wide. The entrance is 56 feet wide, and there is a small railway swing bridge over it.

At the N. E. corner of the northern basin is *Thyen's Dock* (see "DOCKS AND REPAIR CAPACITY," page 27).

Quayage.

| Position. | Length. | Depth alongside at M. L. W. S. | Remarks. |
|---------------------|----------------|--------------------------------|--|
| Town pier..... | Feet. 3,230 | Feet. 24¾ | Iron pier, 42½ feet wide, 6 feet above M. H. W. S., treble line of railway. Stone quays. |
| Vorhafen..... | 330 | 20 | Stone quays. Double line of railway. |
| Northern basin..... | 2,624 | Nontidal. | |
| Southern basin..... | | 17-18 | |
| Kanal Hafen..... | 750 | 17½ | Stone quays. |

Lifting Appliances.

A large number of electric cranes have been established lately on the pier and quays, but their number and capacity is unknown. The largest can lift 20 tons.

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The following cranes have been reported as being on the pier and quays and it is believed that they are all steam cranes, with the possible exception of the first, which may be an electric crane:

- 1—20 tons capacity.
- 1— 5 " "
- 1— 3 " "
- 2— 1¾ " "
- 2— 1½ " "
- 1— 1 ton "

Slips and Building Capacities.

Messrs. G. H. Thyen have two slips for building small ships and there is another shipyard at *Fünfhausen*, about ¾ mile to the southward of Brake. Neither yard can build anything larger than the smallest seagoing fishing vessels.

Docks and Repair Capacity.

There is one dock, which belongs to Messrs. Thyen, at the N.E. corner of the Northern Basin.

It is a double dock (*i. e.*, it has a wing on the southern side), the entrance to which is closed by a pair of gates, which, when open, allow a vessel of 39½ feet beam to enter.

The main dock is 325¾ feet long, 47½ feet wide, and will take vessels up to 13 feet draught and 5,000 tons displacement.

The wing dock is 297 feet long, 38¾ feet wide, and will take vessels up to 8½ feet draught and 2,000 tons displacement.

Both the yards mentioned under "SLIPS AND BUILDING CAPACITY" can undertake minor repairs, Messrs. Thyen having some repair and machine shops near the dry dock.

Lighting and Power.

All the quays and the pier are lit by electricity, and many of the cranes and the grain elevators are driven by electric power, which is believed to be derived from the power station at *Wiessmoor*, near *Aurich* (see Section 1).

Communications.

BY SEA.

Steamers from all parts call at Brake, but the lines and even the sailings for all the ports of the *Lower Weser* are not separated in the official lists and are all included under those from *Bremen* (see pages 40-42).

The *Bremen-Bremerhaven* ferries call here (see page 17).

BY RAIL.

The railways for this part of Oldenburg are described under "NORDENHAM" (page 24).

BY ROAD.

There are a good many roads in all directions to the westward, the direction and distance by road, in statute miles, to the principal towns being:

| To— | Direction. | Distance. | Via. |
|---------------------|------------|-----------------------|---|
| 1. Nordenham..... | N. | Statute miles. 14¾ | Rodenkirchen, 7 miles; Esenshamm, 10½ miles. Strückhausen, 5¾ miles; Jade, 11¾ miles. Meerkirchen, 9¾ miles. Elsfleth, 10 miles. Elsfleth, 10 miles; Alteneesch, 21½ miles. Elsfleth, 10 miles; Delmenhorst, 28 miles. Elsfleth, 10 miles; Alteneesch, 21½ miles; Strom, 28¼ miles. |
| 2. Varel..... | W.N.W. | 18½ | |
| 3. Oldenburg..... | S.W. | 19¾ | |
| 4. "..... | " | 23¾ | |
| 5. Delmenhorst..... | S.S.E. | 28 | |
| 6. Bremen..... | S.E. | 35½ | |
| 7. "..... | " | 33¾ | |

TELEGRAPH AND TELEPHONE.

There are telegraph and telephone stations at Brake which are in connection with the main systems of the Empire.

Coal, Oil, and Stores.

A stock of about 800 or 900 tons of coal is to be found at Brake and ships are coaled alongside the pier and quays.

It is not known whether any oil tanks exist.

Ships' stores and provisions may be obtained at any time in reasonable quantities.

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Trade and Shipping.

The trade statistics are included under those for the port of Bremen (see page 35). The following table shows the shipping entered and cleared in 1911:

| Entered. | | | | Cleared. | | | | Total. | |
|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|--------|----------------|
| With cargo. | | In ballast. | | With cargo. | | In ballast. | | Ships. | Gross tonnage. |
| Ships. | Gross tonnage. | Ships. | Gross tonnage. | Ships. | Gross tonnage. | Ships. | Gross tonnage. | | |
| 380 | 330,697 | 60 | 2,402 | 180 | 19,492 | 268 | 265,988 | 888 | 618,579 |

Hospitals.

There are two hospitals in Brake (one of which belongs to the Imperial Navy), but neither their positions nor their capacities are known.

ELSFLETH.

(See Plate 4.)

This is a small fishing port about 1½ miles up the *Hunte River* from its confluence with the *Weser*, and about 20 nautical miles above *Bremerhaven*.

Approach from the Weser River.

The approach is up the *Hunte*, which here lies to the westward of an island called the *Warte Plate*.

The least depth in this approach at M.L.W.S. is 10½ feet (19¾ ft. M.H.W.S.), close to the mouth of the *Hunte*.

The channel is 500 feet wide at the confluence of the rivers, and at *Elsfleth* 360 feet.

Piers and Quays.

The "*Elsfleth Hochsee Haringsfischereigesellschaft*" have a pier on the left (west) bank of the *Hunte*, which is 640 feet long, and has 10 feet of water M.L.W.S. alongside.

Immediately above the first pier is another short quay, belonging to the *Elsfleth Saw Mills Co.*

Next above this is the quay of the "*Weser Haringsfischereigesellschaft*," which is 525 feet long and has a depth of 9 feet M.L.W.S. alongside.

Next, about the middle of the town, is the "*Weserkai*," which is 394 feet long and has 5 feet of water alongside at M.L.W.S.

Just above the "*Weserkai*" is the *Railway Quay*. It is 1,312 feet long and has depths of 7½ to 10 feet M.L.W.S. alongside. It has a double railway track from end to end.

Just to the southward of this quay and the mouth of the *Hafen* is the pier of the *Holzimpfrierungsgesellschaft*, which also has a depth of 10 feet alongside at M.L.W.S. This pier has on it a single line of railway, which is connected with the *Oldenburg State Railway*.

Basins.

There are two basins, the *Hafen* and the *Tidehafen*. The *Hafen* is nontidal, being entered through a dock gate; but the *Tidehafen*, as its name implies, is tidal.

In the *Hafen* there are 11½ to 9¾ feet of water, and in the *Tidehafen*, at M.L.W.S., 10¼ feet.

The *Hafen* has stone quays, but their dimensions are unknown, as also are those of the quays of the *Tidehafen*, which has lately been enlarged.

Lifting Appliances.

There are two steam cranes on the railway pier, but their capacity is not known. They can load vessels lying alongside direct from railway trucks on the quay.

Communications.

RAILWAY.

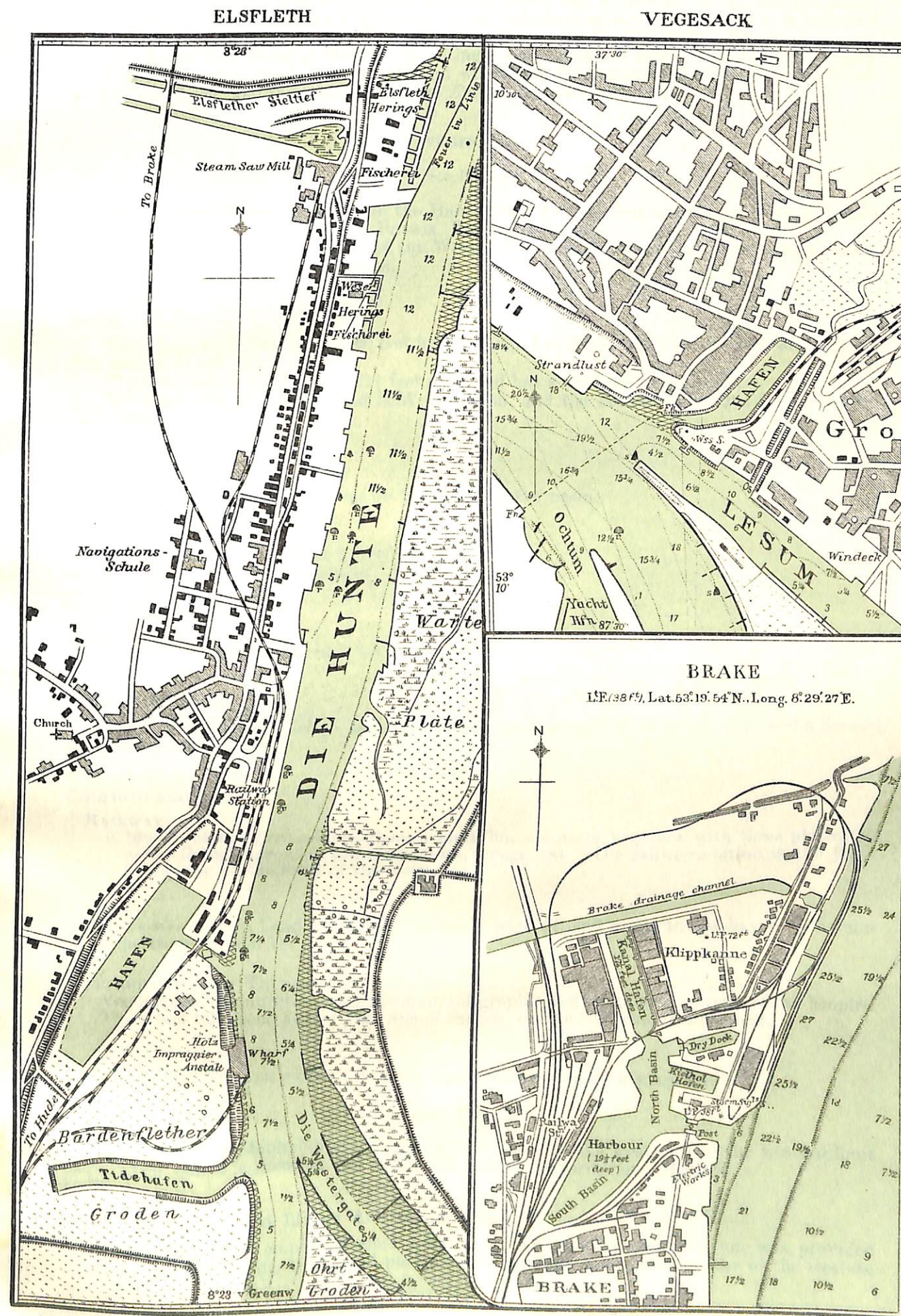
Elsfleth is on the main line from *Hude* to *Blexen* (see page 22).

ROADS.

See under **BRAKE**, "COMMUNICATIONS," page 27.

Pt. II, sec. 3.

BRAKE, ELSFLETH AND VEGESACK.



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TELEGRAPH AND TELEPHONE.

Elsfleth is in connection with the main telegraphic and telephonic systems of the Empire. There is a telephone in the *Harbour Master's Office* (? position).

CANAL.

The Hunte River has been canalized as far as *Oldenburg*, a distance of $12\frac{1}{2}$ nautical miles.

At present vessels drawing $11\frac{1}{2}$ feet can reach *Oldenburg* at mean H. W., but it is proposed to deepen and widen not only this portion of canal, but also the *Hunte-Ems Canal*.

The *Hunte-Ems Canal* at the time of writing is only a shallow drainage canal for the *Sagter Land* moors, but it is proposed to deepen and widen it so that vessels may pass from the *Hunte* to the *Leda* River, and thus debouch on the *Ems* at *Leer* (see section 1).

VEGESACK.

(See Plate 4.)

This is a small port belonging to the Hansa town *Bremen*, but the village of *Fahr*, which adjoins it on the western side, is in Prussia, Province Hannover.

Vegesack is on the right bank of the Weser, at the confluence of the river *Lesum*, about $26\frac{1}{2}$ nautical miles above *Bremerhaven*.

Basin.

There is a small tidal basin, 860 feet long and 230 feet broad and $13\frac{1}{2}$ feet deep M. L. W. S.

($20\frac{1}{2}$ feet M. H. W. S.).

The entrance to the basin is $52\frac{1}{2}$ feet wide and has a drawbridge across it.

The basin lies in a NNE. and SSW. direction, and the Southeastern Quay is served by the railway.

Lifting Appliances.

There are the following cranes on the quays of the basin:

EAST QUAY.

- 1 fixed hand crane of 5 tons' capacity.
- 1 traveling steam crane of 5 tons' capacity.
- 1 " " " " 15 " " "

WEST QUAY.

- 1 fixed hand crane of 1 ton capacity.

Slips and Dock.

The "*Bremer Vulkan Schiff- und Maschinenbaugesellschaft*" have several slips and a floating dock (see below).

Communications.**RAILWAY:**

A branch of the *Bremerhaven-Bremen* main line connects Vegesack with these places (see under *Bremerhaven*, "Communications," page 18). The railway station is 175 yards to the east of the head of the basin.

ROADS:

See under *Hadeln Land*, "Communications," page 44, and under *Bremerhaven*, "Communications," page 18.

TELEGRAPHS AND TELEPHONES:

Vegesack is in connection with the main telegraphic and telephonic systems of the Empire. There is a telephone at the *Tide Signal Station*, on the SW. side of the basin.

BREMER VULCAN SCHIFF- UND MASCHINENBAUGESELLSCHAFT.

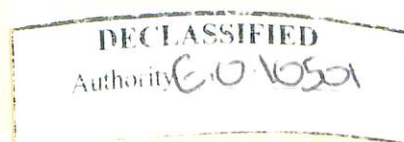
(See Plate 5.)

This firm has a shipbuilding yard about 200 yards to the westward of the western limit of the town, and it is therefore not in the free city of *Bremen*, but in *Prussia*.

Hands Employed and Living Accommodation.

In 1912 the firm employed some 4,000 men, for whom accommodation was provided partly in the surrounding towns and partly on the western and northern sides of the western end of the yard.

Pt. II, sec. 3.



Trade and Shipping.

The trade statistics are included under those for the port of Bremen (see page 35). The following table shows the shipping entered and cleared in 1911:

| Entered. | | | | Cleared. | | | | Total. | |
|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|--------|----------------|
| With cargo. | | In ballast. | | With cargo. | | In ballast. | | Ships. | Gross tonnage. |
| Ships. | Gross tonnage. | Ships. | Gross tonnage. | Ships. | Gross tonnage. | Ships. | Gross tonnage. | | |
| 380 | 330,697 | 60 | 2,402 | 180 | 19,492 | 268 | 265,988 | 888 | 618,579 |

Hospitals.

There are two hospitals in Brake (one of which belongs to the Imperial Navy), but neither their positions nor their capacities are known.

ELSFLETH.

(See Plate 4.)

This is a small fishing port about 1½ miles up the *Hunte River* from its confluence with the *Weser*, and about 20 nautical miles above *Bremerhaven*.

Approach from the Weser River.

The approach is up the *Hunte*, which here lies to the westward of an island called the *Warte Plate*.

The least depth in this approach at M.L.W.S. is 10½ feet (19¾ ft. M.H.W.S.), close to the mouth of the *Hunte*.

The channel is 500 feet wide at the confluence of the rivers, and at *Elsfleth* 360 feet.

Piers and Quays.

The "*Elsfleth Hochsee Haringfischereigesellschaft*" have a pier on the left (west) bank of the *Hunte*, which is 640 feet long, and has 10 feet of water M.L.W.S. alongside.

Immediately above the first pier is another short-quay, belonging to the *Elsfleth Saw Mills Co.*

Next above this is the quay of the "*Weser Haringfischereigesellschaft*," which is 525 feet long and has a depth of 9 feet M.L.W.S. alongside.

Next, about the middle of the town, is the "*Weserkai*," which is 394 feet long and has 5 feet of water alongside at M.L.W.S.

Just above the "*Weserkai*" is the *Railway Quay*. It is 1,312 feet long and has depths of 7½ to 10 feet M.L.W.S. alongside. It has a double railway track from end to end.

Just to the southward of this quay and the mouth of the *Hafen* is the pier of the *Holz-imprägnierungsgesellschaft*, which also has a depth of 10 feet alongside at M.L.W.S. This pier has on it a single line of railway, which is connected with the *Oldenburg State Railway*.

Basins.

There are two basins, the *Hafen* and the *Tidehafen*. The *Hafen* is nontidal, being entered through a dock gate; but the *Tidehafen*, as its name implies, is tidal.

In the *Hafen* there are 11½ to 9¾ feet of water, and in the *Tidehafen*, at M.L.W.S., 10½ feet.

The *Hafen* has stone quays, but their dimensions are unknown, as also are those of the quays of the *Tidehafen*, which has lately been enlarged.

Lifting Appliances.

There are two steam cranes on the railway pier, but their capacity is not known. They can load vessels lying alongside direct from railway trucks on the quay.

Communications.

RAILWAY.

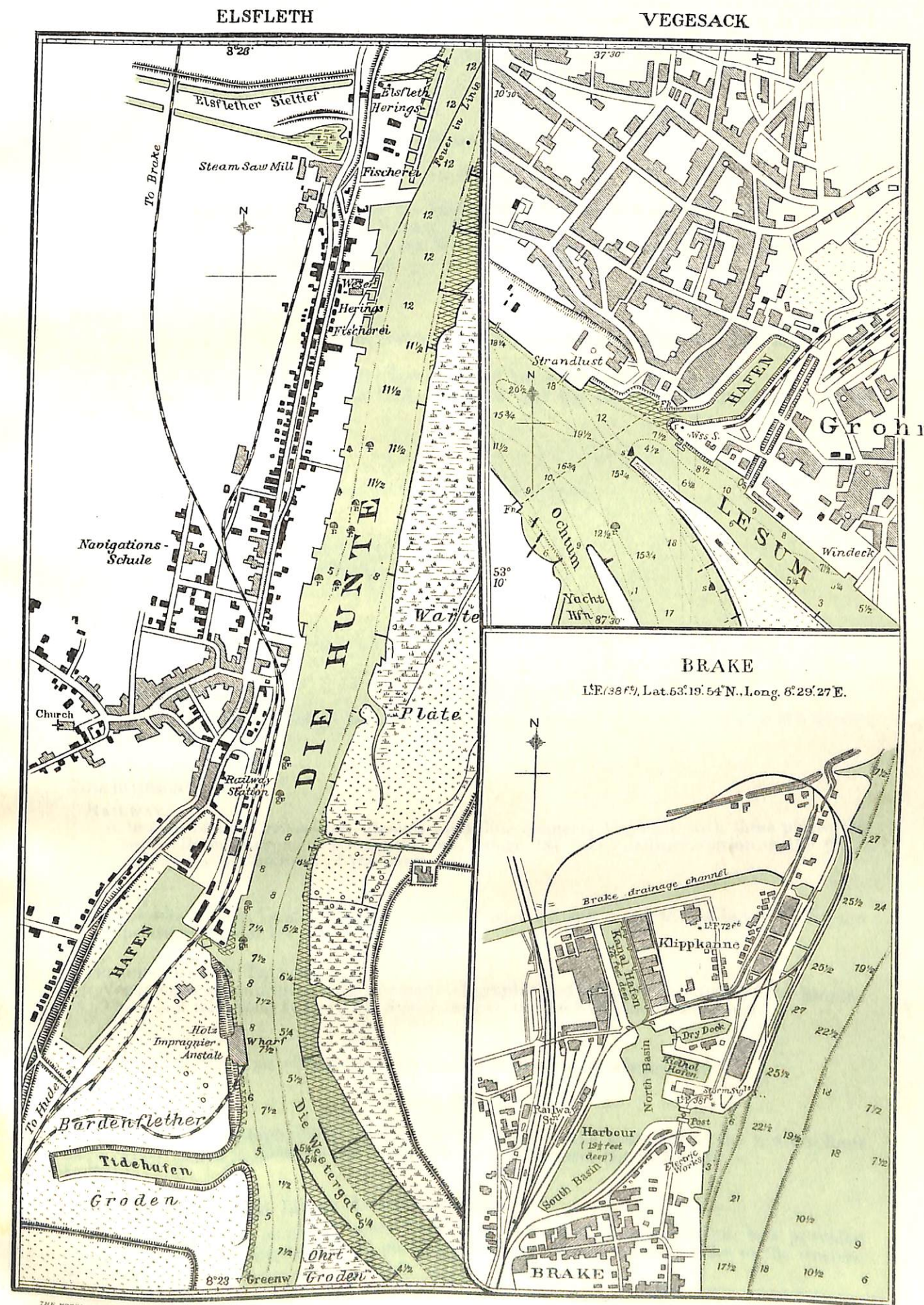
Elsfleth is on the main line from *Hude* to *Blexen* (see page 22).

ROADS.

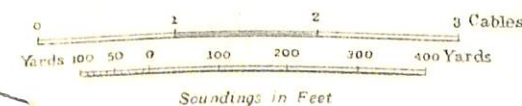
See under **BRAKE**, "COMMUNICATIONS," page 27.

Pt. II, sec. 3.

BRAKE, ELSFLETH AND VEGESACK.



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Ordnance Survey, Southampton 1915

TELEGRAPH AND TELEPHONE.

Elsfleth is in connection with the main telegraphic and telephonic systems of the Empire. There is a telephone in the *Harbour Master's Office* (? position).

CANAL.

The Hunte River has been canalized as far as *Oldenburg*, a distance of $12\frac{1}{2}$ nautical miles.

At present vessels drawing $11\frac{1}{2}$ feet can reach *Oldenburg* at mean H. W., but it is proposed to deepen and widen not only this portion of canal, but also the *Hunte-Ems Canal*.

The *Hunte-Ems Canal* at the time of writing is only a shallow drainage canal for the *Sagter Land moors*, but it is proposed to deepen and widen it so that vessels may pass from the *Hunte* to the *Leda* River, and thus debouch on the *Ems* at *Leer* (see section 1).

VEGESACK.

(See Plate 4.)

This is a small port belonging to the Hansa town *Bremen*, but the village of *Fahr*, which adjoins it on the western side, is in Prussia, Province Hannover.

Vegesack is on the right bank of the Weser, at the confluence of the river *Lesum*, about $26\frac{1}{2}$ nautical miles above *Bremerhaven*.

Basin.

There is a small tidal basin, 860 feet long and 230 feet broad and $13\frac{1}{2}$ feet deep M. L. W. S. ($20\frac{1}{2}$ feet M. H. W. S.).

The entrance to the basin is $52\frac{1}{2}$ feet wide and has a drawbridge across it.

The basin lies in a NNE. and SSW. direction, and the Southeastern Quay is served by the railway.

Lifting Appliances.

There are the following cranes on the quays of the basin:

EAST QUAY.

1 fixed hand crane of 5 tons' capacity.
1 traveling steam crane of 5 tons' capacity.
1 " " " " 15 " "

WEST QUAY.

1 fixed hand crane of 1 ton capacity.

Slips and Dock.

The "*Bremer Vulkan Schiff- und Maschinenbaugesellschaft*" have several slips and a floating dock (see below).

Communications.**RAILWAY:**

A branch of the *Bremerhaven-Bremen* main line connects Vegesack with these places (see under *Bremerhaven*, "Communications," page 18). The railway station is 175 yards to the east of the head of the basin.

ROADS:

See under *Hadeln Land*, "Communications," page 44, and under *Bremerhaven*, "Communications," page 18.

TELEGRAPHS AND TELEPHONES:

Vegesack is in connection with the main telegraphic and telephonic systems of the Empire. There is a telephone at the *Tide Signal Station*, on the SW. side of the basin.

BREMER VULCAN SCHIFF- UND MASCHINENBAUGESELLSCHAFT.

(See Plate 5.)

This firm has a shipbuilding yard about 200 yards to the westward of the western limit of the town, and it is therefore not in the free city of *Bremen*, but in *Prussia*.

Hands Employed and Living Accommodation.

In 1912 the firm employed some 4,000 men, for whom accommodation was provided partly in the surrounding towns and partly on the western and northern sides of the western end of the yard.

Pt. II, sec. 3.



Area.

The yard covers an area of about 50 acres, with a frontage on the river of 1,100 yards.

Quay.

There is a fitting-out quay in the middle of the water frontage. It is 985 feet long and has a depth of 21 (?) feet alongside at M. L. W. S.

This quay has a single railway track on it, which is connected with the Vegesack branch of the main line.

Lifting Appliances.

There are the following cranes and sheers:

| Position. | No. | Capacity. | Power. | Remarks. |
|--------------------------|-----|--------------|---------------|------------------|
| Western end of quay..... | 1 | Tons. 100 | Electric..... | Turret crane. |
| Eastern end of quay..... | 1 | 35 | Steam..... | Sheers. |
| On quay rails..... | 1 | 30 | Electric..... | Traveling crane. |
| Between slips..... | 7 | 6 | ? | .. |

Slips.

There are six slips of the following dimensions:

| Slip. | Position. | Length. | Breadth. |
|--------------|---------------------------------|--------------------|-------------------|
| No. I*..... | At the western end of the yard. | <i>Ft.</i> 393½ | <i>Ft.</i> 57½ |
| No. II..... | | 541½ | 65 |
| No. III..... | | 574 | 72 |
| No. IV..... | | 705 | 82 |
| No. V..... | | 393½ | 65 |
| No. VI..... | | 393½ | 65 |

* No. 1 is the eastern slip of this group.

There are also some small slips at the eastern end of the yard.

Building Capacity.

The firm has built three vessels of over 500 feet in length and 12,000 tons gross register within the last two years, as well as several smaller vessels for commercial purposes. It has not built any war vessels.

It has, however, built numerous tugs, fishing vessels, lighters, bridges, and boilers and engines.

Dock.

The firm owns a floating dock.

| Dock. | Position. | Length. | Width. | Depth over blocks. | Lifting capacity. |
|--------------------|------------------------|---------|--------|--------------------|-------------------|
| Bremer Vulkan..... | Near E. end of yard... | ? | ? | ? | ? |

Repair Capacity.

The firm undertakes repairs of any or all descriptions.

Machine Shops.

The shops are shown on plate 5. They are large and well equipped in every respect.

Lighting and Power.

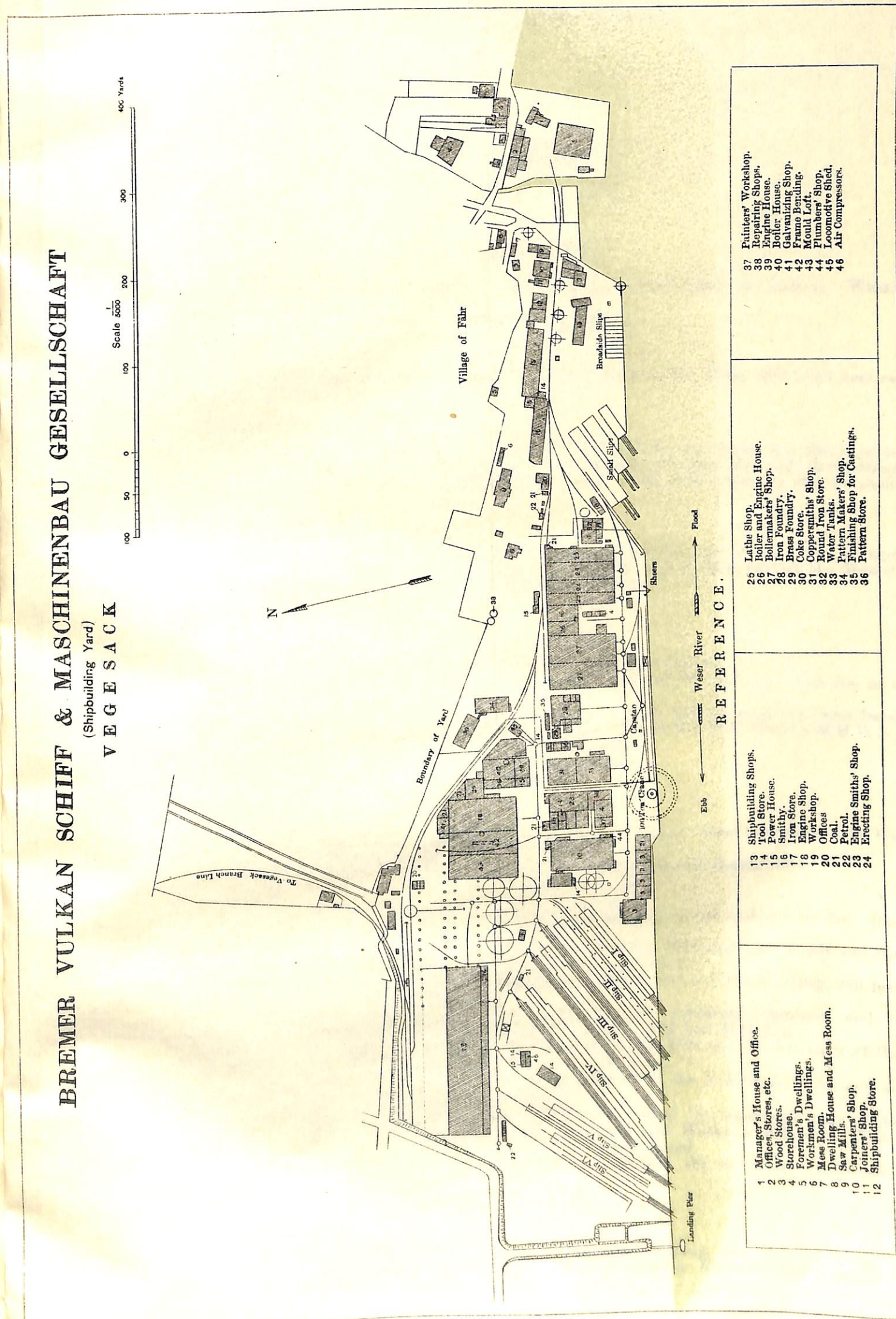
There are two electric power stations in the yard (see plate 5), which supply both light and power.

There is also an air-compressing station between the heads of No. IV and V slips.

Communications.

The yard is connected by rail with the branch line of the main railway (see page 29), and it is intersected in all directions by railway tracks.

Pt. II, sec. 3.



- REFERENCE.**
- 1 Manager's House and Office.
 - 2 Offices, Stores, etc.
 - 3 Wood Stores.
 - 4 Storehouse.
 - 5 Foremen's Dwellings.
 - 6 Workmen's Dwellings.
 - 7 Mess Room.
 - 8 Saw Mill.
 - 9 Mess Room and Mess Room.
 - 10 Carriers' Shop.
 - 11 Joiners' Shop.
 - 12 Shipbuilding Store.
 - 13 Shipbuilding Shops.
 - 14 Tool Store.
 - 15 Power House.
 - 16 Smithy.
 - 17 Iron Store.
 - 18 Engine Shop.
 - 19 Workshop.
 - 20 Offices.
 - 21 Coal.
 - 22 Ferrol.
 - 23 Engine Smith's Shop.
 - 24 Erecting Shop.
 - 25 Lathe Shop.
 - 26 Boiler and Engine House.
 - 27 Boilermakers' Shop.
 - 28 Iron Foundry.
 - 29 Brass Foundry.
 - 30 Coke Store.
 - 31 Copper-smith's Shop.
 - 32 Foundry.
 - 33 Pattern Makers' Shop.
 - 34 Finishing Shop for Castings.
 - 35 Eastern Store.
 - 36
 - 37 Painters' Workshop.
 - 38 Repairing Shops.
 - 39 Engine House.
 - 40 Boiler House.
 - 41 Foundry.
 - 42 Foundry.
 - 43 Foundry.
 - 44 Foundry.
 - 45 Locomotive Shed.
 - 46 Air Compressors.

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THE HORNBY PETERS CO. WASHINGTON, D. C.

BREMEN.

(See Map 8A and Plan 13.)

APPROACHES.

Information as to the approaches to Bremen will be found under the heading "WESER RIVER," page 22.

COMMERCIAL PORT.**Position.**

The city and port of Bremen are situated on both banks of the Weser, about 33½ nautical miles above *Bremerhaven*.

Administration.

The port is directly administered by the Government of the city, which is a Hansa town. Included in the administration are the ports of *Veegesack* (see page 29) and *Bremerhaven* (see page 3), and these are treated as part of the port, which thus covers an area of about 75 square miles.

Moles and Piers.

A mole, about 1,500 yards long, has been built from the end of the point of land separating the *Weser* from the *Kleine Weser* (the remains of a shallow arm of the Weser), parallel to the left bank of the river and about 100 yards from it.

Basins.**OBERWESER HAFEN.**

This is a small basin about 475 yards above the *Grosse Weser Brucke*.

It opens direct on to the *Weser* and is 754 feet long and 164 feet wide and lies in a southeast and northwest direction.

It was at one time part of the moat round the city walls, but the bank has been faced with wood, forming quays, alongside of which there are 8 feet at M.L.W.S. (13 feet M.H.W.S.) and on which there are three hand cranes of 1½ tons capacity.

A mole has been built in the *Weser* to enclose this basin.

It is used mostly by river and canal craft.

HOLZ HAFEN.

This is a shallow basin opening directly on to the *Kleine Weser* immediately to the westward of the *Oberweser Hafen*.

It was part of the city moat and is only a large timber pond with sloping sides.

HOHENTHORS HAFEN.

This is the oldest basin still used by seagoing ships and is not included in the "free area."

It is divided into two parts, the western being called the *Woltmershauser Kanal* and the eastern the *Sicherheits Hafen*, the latter being part of the city moat.

The *Sicherheits Hafen* lies in a north and south direction and is 1,215 feet long, 230 feet wide and is 17½ feet deep M.L.W.S.

The *Woltmershauser Kanal* lies in a northwest and southeast direction and is 2,300 feet long, 164 feet wide, and 17½ feet deep M.L.W.S. (22½ feet M.H.W.S.).

The Hohenthors Hafen is entered at km. 2.5 between the *Mole* and the left bank of the *Weser* and there are 16½ feet of water M.L.W.S. in this entrance.

The Neustadt Railway Station lies just to the eastward of the *Sicherheits Hafen* and all the quays are served by branch lines of the railway.

There is a large coal discharging place at the eastern end of the southwest quay of the *Woltmershauser Kanal*, where the coal for the Municipal Gas Works is unloaded. These Gas Works are about 550 yards south of the *Woltmershauser Kanal*.

The Hohenthors Hafen has a total quayage of 2,560 feet, the remainder of the sides being sloping.

For Lifting Appliances see page 33.

THE FREE HARBOUR.

There are two entrances to the Free Basins, the first, leading into *Hafen I*, being at km. 4, and the second, leading into *Hafens II and III* and the *Holz und Fabriken Hafen* (which is not a "free area"), being close to km. 5.5.

Hafen I.

This is a long, more or less rectangular, tidal basin about 6,000 feet long, 394 feet wide, and 18 feet deep at M.L.W.S. (23 feet M.H.W.S.).

It lies in a southeast and northwest direction parallel to the Weser and its entrance is 197 feet wide.

There are two railway lines on both sides of it behind which are goods sheds. Again behind these is a double railway track flanked by a further grain and goods sheds.

One or two spaces between the sheds are reserved, however, for storing wood in the open. The quays are of stone with wooden scotchmen.

On these quays there are no less than 85 travelling cranes and in the basin there is a steam floating crane of 40 tons capacity. (For details see under "LIFTING APPLIANCES, SUMMARY," page 33.)

There is a large landing pier in the centre of the head of the basin, and near its mouth on the southwest side are two floating docks (see "DOCKS, SUMMARY," page 34).

Hafen II.

This basin is entered through the so-called *Vorhafen* direct from the *Weser*. The entrance is 225 feet wide and the *Vorhafen*, a basin of irregular shape, is 1,148 feet long and 689 feet wide. This basin is 27½ feet deep M.L.W.S.

Hafen II is an elongated basin very similar to *Hafen I*, except that its sides are not quite straight.

It is 5,645 feet long, 328 feet wide, and 27 feet deep at M.L.W.S. (32 feet M.H.W.S.) and has stone quays on both sides, on which are 34 electric and hydraulic cranes, and one floating crane (see "LIFTING APPLIANCES—SUMMARY," page 33).

The arrangement of goods and grain sheds and of the railway tracks is similar to that on the quays of *Hafen I*, and the head of the basin is provided with a pier in like manner.

Hafen III.

This is a basin joining the *Vorhafen* and the *Holz und Fabriken Hafen*. It is entered direct from the former in an easterly course and curves gradually round until it joins the latter, which lies in a S.E. and N.W. direction.

For a distance of 985 feet from the basin it is 900 feet wide and beyond that only 312 feet wide.

It is 21 feet deep M.L.W.S. (26 feet M.H.W.S.) and is included in the "free area." In the wide part of the basin at a distance of 590 feet from the north side and 310 feet from the south side there are five dolphins, 197 feet apart, to which vessels are moored forward, the stern being secured to the North bank.

All along the inner side of the curve of this basin are stone quays, 2,133 feet long, equipped with a double line of railway and numerous electric cranes (numbers and power unknown).

Holz und Fabriken Hafen.

This is a continuation of *Hafen III* and is 3,610 feet long, 295 feet wide on an average, and varies in depth from 21 to 14 feet at M.L.W.S.

It is served by a double line of railway on both sides and has, on its S.W. side, a steel wharf, 1,970 feet long at the upper end of the basin. At about the centre of the N.E. side there is another steel wharf 480 feet long and a stone quay 1,750 feet long. Elsewhere the sides of this basin are sloping.

WERFT HAFEN.

This basin, which belongs to the *Weser A.-G.* (shipbuilders), lies on the N.W. side of the *Vorhafen* on to which it opens direct.

It is 3,960 feet long, and for half of its length 377 feet wide, the remainder having a mean width of 600 feet.

It is 26½ feet deep M.L.W.S. and near the entrance from the *Vorhafen* on the N.E. side is the large dock belonging to the *Weser A.-G.*, for details of which see under "DOCKS—SUMMARY," page 34.

Further information about this basin will be found under "PRIVATE SHIPBUILDING YARDS," pages 36 and 37.

INDUSTRIE- UND HANDELS-HAFEN.

This is the latest built of the harbours of Bremen, having been commenced in 1903.

It is entered from the *Weser* at km. 9, through the *Vorbassin*, a rectangular basin 1,148 feet long (E. b. N. and W. b. S.) and 295 feet wide.

At the head of this *Vorbassin* is a lock 561½ feet long, 164 feet wide, and 23½ feet deep on the sill at M.L.W.S. (28½ feet M.H.W.S.).

Beyond the lock there is a long basin lying approximately E. and W. called *Hafen A*. It is 8,200 feet long, 325 feet wide, and 25½ feet deep.

Five basins are being constructed branching off from *Hafen A* in a northeasterly direction. These are called *Hafens B. to F.*, the Western one being *B*.

Hafen B. is 3,800 feet long, 295 feet wide, and is believed to be 24½ feet deep.

About 850 feet from the head of *Hafen B.* a narrow basin has been built in a westnorth-westerly direction and is called *Hafen G*.

Hafen G. is 2,580 feet long, 150 feet wide, and is also believed to be 24½ feet deep.

Pt. II, sec. 3.

The tanks of the Vacuum Oil Company are near the head of this basin on the N.E. side. *Hafens C., D.,* and *E.* are still under construction (1915), and are to be 2,953, 2,297, 1,640 feet long respectively, and they are all to be 328 feet wide.

Hafen F. was completed in 1914 and branches off 985 feet from the head of *Hafen A*. It is 985 feet long, and the same width as the basins now building, except at the mouth, where it is funnel shaped.

It is not known what cranes, goods sheds, or railway lines there are on the quays of these basins, except that the cranes are driven electrically, and one of them has a capacity of 12½ tons.

Neither is it known how much of the sides of the basins are quays.

Quayage.

SUMMARY.

| River or Basin. | Position. | Length. | Depth alongside M.L.W.S. | Remarks. |
|-------------------------------|--|---------|--------------------------|---|
| | | Feet. | Feet. | |
| Grosse Weser..... | "An der Tiefer." Just above the Grosse Weser Brücke, right bank. | 755 | 10 | Above railway bridge, the Kaiser and the Grosse Weser Brücke. " " |
| | Ober Weser Hafen. Just above the Grosse Weser Brücke, left bank. | 755 | 8 | " " " |
| | "Schlachte." Just below the Kaiser Brücke on right bank. | 230 | 11 | Above railway bridge. |
| Hohenthors Hafen..... | Weser Railway Station quay..... | 1,600 | 12 | Just below bridges. |
| | Sicherheits Hafen, W. side..... | 357 | 17½ | Below bridges. |
| Free Harbour..... | Woltmershauser Kanal, S.W. side..... | 1,410 | 17½ | Steel wharves. |
| | Hafen I., both sides..... | 12,955 | 18 | Stone quays. |
| | Hafen II., both sides..... | 11,250 | 27 | " " |
| | Hafen III., S. side..... | 2,133 | 21 | " " |
| | Holz- und Fabriken-Hafen— | | | " " |
| | S.W. side..... | 1,970 | 21-16 | Steel wharf. |
| | N.E. side..... | 2,230 | 14 | " " and stone quay. |
| | Vorhafen, W. and S. sides..... | 1,600 | 27 | Stone quays. |
| | Werft Hafen..... | 1,968 | 26 | Fitting-out wharves. |
| Industrie- und Handels-Hafen. | Hafens A., B., F., and G..... | ? | 24½ | There are many quays, but their dimensions are not known. |
| | Projected total quayage of all basins of the Industrie- und Handels-Hafen. | 13,800 | 27 | |

Lifting Appliances.

SUMMARY.

| River or Basin. | Position. | No. | Capacity. | Power. | Remarks. |
|--|--|------|-----------|-----------|--|
| | | | Tons. | | |
| Oberweser Hafen and wharves above the bridges. | | 7 | 1½ | Hand | |
| Railway Quay..... | On quay..... | 3 | 1½ | " | Fixed, swinging cranes. |
| | | 6 | 1½ | " | Travelling cranes. |
| | | 3 | 1½ | Electric | " " |
| | | 1 | 2 | " | " " |
| Hohenthors Hafen..... | On quays..... | 1 | 24 | " | Fixed, swinging crane. |
| | | 1 | 1 | Hand | " " |
| | | 1 | 1½ | " | Travelling crane. |
| | | 2 | 1½ | Steam | " " |
| | | 1 | 1½ | Gas motor | " " |
| | | 1 | 2 | Hand | Fixed, swinging crane. |
| | | 3 | 3½ | Gas motor | Travelling cranes. |
| Free Harbour..... | On the quays of Hafens I., II., and III. | 1 | 4½ | Hand | Fixed, swinging crane. |
| | | 56 | 1½ | Hydraulic | Travelling. Hoist 54 feet. Radius, 33½ feet. |
| | | 2 | 1½ | " | Fixed, swinging cranes. |
| | | 12 | 2½ | " | Travelling cranes. |
| | | 1 | 4 | " | " " |
| | | 1 | 10 | " | Fixed, swinging crane. |
| | | 1 | 6 | " | Coal tip. |
| | | 1 | 26 | " | " " |
| | | 30 | ? | Electric | Cranes. |
| "..... | Hafen I. Floating..... | 1 | 40 | ? | " |
| "..... | Hafen II. "..... | 1 | ? | ? | " |
| | Between the goods sheds and the grain sheds. | 5 | 1½ | Hydraulic | Travelling cranes. |
| | | 10 | 1½ | " | Fixed cranes. |
| | | 18 | 1½ | " | Winch cranes. |
| Holz- und Fabriken-Hafen. | On quays..... | 8 | 2 | Electric | Travelling cranes. |
| Industrie- und Handels-Hafen. | On quays..... | Many | ? | " | Cranes. |

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There is also a pair of 40-ton steam floating sheers, self-propelling. They can lift their maximum load at a distance of 24½ feet from the hull to a height of 62 feet above water.

Each of the 1½ and 2½-ton hydraulic travelling cranes mentioned in the above table occupies 10 feet of the crane track, and they are so arranged that they span the double railway track at a sufficient height to clear a standard truck fully loaded.

Docks.

SUMMARY.

| Dock. | Position. | Length. | | | Width. | | | Depth on Sill. | | | Remarks. |
|--|-------------------------------|---------|-------|-------|--|-------------|-------|----------------|-------|--|----------|
| | | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | | |
| Floating No. I..... | Near mouth of werft Hafen. | 485½ | 90½ | 23 | Lifting capacity, 11,500 tons. With extra section, 15,000 tons. | | | | | | |
| Floating No. II..... | | 656 | 90½ | 23 | | | | | | | |
| Floating No. III..... | Near mouth of Hafen I..... | 135½ | 46 | 18 | Lifting capacity, 1,083 tons. Lifting capacity, 1,673 tons. | | | | | | |
| Floating No. III..... | | 196½ | 49½ | 18 | | | | | | | |
| Floating Docks Nos. II. and III. can be joined in two different ways, A and B. | | | | | | | | | | | |
| Floating Nos. II. and III. | ..... | 334½ | 46 | 18 | In conjunction, system A. | | | | | | |
| | | 380½ | 46 | 18 | | " system B. | | | | | |

Lifting and Power.

Bremen is lit by electricity though many of the smaller streets are lit by gas; the quays are lit almost entirely by electricity (arc lights).

The main *Electric Power House* is close to the northward of the engine houses of the main Goods Station (see under "TOWN," page 39), and about 1,400 yards due north of the Cathedral.

There are four substations, one of which is at the head of *Hafen I.*, which have been established to cope with the increased consumption of electricity due to the introduction of electric light in private houses and some of the streets, and the extensive use now made of electric power in the port, though there is a special *Electric Power House* for *Hafens II. and III.* close to the northward of *Hafen II.* at the southeastern end. The three other substations are: (1) N.W. 340 yards, (2) E.N.E. 800 yards, and (3) N.N.E. 1,880 yards from the Cathedral.

These power houses supply both light and power to the quays of the river and basins. The electric power house at the head of the *Hafen I.* contains the power plant for the hydraulic system.

As will be seen by reference to the table of Lifting Appliances, page 33, many of the cranes are driven hydraulically.

The electric power stations provide electricity at 220 volts, continuous current.

The hydraulic power station supplies water at a pressure of 740 lbs. per square inch.

Water.

The principal waterworks are on the tongue of land between the *Weser* and *Kleine Weser*, just above the *Oberweser Hafen* (left bank of *Weser*).

Water is supplied to ships alongside the quays by means of hoses from hydrants. It is reported to be of excellent quality for drinking.

Communications.

Nearly every quay is served by the railway, and there are an enormous number of sidings all round the *Free Harbour* (see under "BASINS," page 31).

The city trams run to a point about 300 yards to the east-southeastward of the head of the *Holz und Fabriken Hafen*, and 350 yards to the northeastward of the head of *Hafen II.*

Coal.

This commodity may be obtained to an almost unlimited quantity.

There are always at least 6,000 tons of coal in stock, and it is supplied to ships in the basins either by rail and crane or in lighters.

Oil.

The *Deutsch-Amerikanischer Petroleum Gesellschaft* have an oil refinery and storage tanks on the right bank of the *Weser* southwest of the centre of *Hafen I.*

The *Vacuum Oil Company* owns several tanks and a refinery near the head of *Hafen G.* of the *Industrie- und Handels-Hafen.*

About 55,000 tons of crude petroleum were imported in 1912.

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Stores.

Bremen, being the second largest port of the Empire, can supply stores in almost unlimited quantities.

Harbour Craft.

There are 43 harbour and lower river tugs with a total registered tonnage of 1,540 tons.

In addition to these there are many small canal tugs for the upper river traffic, (?) three ice-breakers, and several self-propelling water and oil tanks.

Trade.

| | 1911 | | 1912 | | 1913 | |
|--------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|
| | Amount. | Value. | Amount. | Value. | Amount. | Value. |
| Imports..... | Tons. 6,626,935 | £ 106,236,480 | Tons. 7,048,470 | £ 110,903,480 | Tons. 7,481,995 | £ 124,565,455 |
| Exports..... | 4,953,830 | 102,390,690 | 5,160,120 | 110,416,650 | 5,346,365 | 119,697,645 |
| Total..... | 11,580,765 | 208,627,170 | 12,208,590 | 221,320,130 | 12,828,360 | 244,263,100 |

Imports and exports from and to British Isles (included in above).

| | 1911 | | 1912 | | 1913 | |
|--------------|---------------|-------------|---------------|-------------|---------------|-------------|
| | Amount. | Value. | Amount. | Value. | Amount. | Value. |
| Imports..... | Tons. 324,155 | £ 3,810,315 | Tons. 316,600 | £ 4,393,440 | Tons. 345,100 | £ 6,105,800 |
| Exports..... | 148,880 | 7,548,565 | 184,108 | 7,666,100 | 243,310 | 10,107,400 |
| Total..... | 473,035 | 11,358,880 | 500,708 | 12,059,540 | 588,410 | 16,213,200 |

The principal imports are grain, rice, cattle-fodder, building materials, coal and coke manures, ores (especially pyrites and zinc ore), metals (copper 65,000 tons in 1913), oils (mineral, animal, and vegetable), raw cotton, wool, porcelain, coffee, and tobacco.

N.B.—These tables include the trade of the following ports:

| | |
|-----------------|--------------|
| Vege sack | see page 29. |
| Elsfleth | " 28. |
| Brake | " 26. |
| Nordenham | " 23. |
| Geestemünde | " 3. |
| and Bremerhaven | " 5. |

Shipping.

The following table shows the number and tonnage of ships entered and cleared, not only from Bremen but also from the ports mentioned above, during three years:

| | 1911 | | | | 1912 | | | | 1913 | | | |
|--------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| | With cargo. | | In ballast. | | With cargo. | | In ballast. | | With cargo. | | In ballast. | |
| | Ships. | Reg. tons. | Ships. | Reg. tons. | Ships. | Reg. tons. | Ships. | Reg. tons. | Ships. | Reg. tons. | Ships. | Reg. tons. |
| Entered..... | 6,083 | 4,516,782 | 1,760 | 1,370,490 | 6,355 | 4,952,460 | 1,850 | 1,536,033 | 6,323 | 5,251,270 | 1,793 | 1,530,020 |
| Cleared..... | 6,228 | 4,479,330 | 1,760 | 1,370,490 | 6,562 | 4,953,165 | 1,850 | 1,536,033 | 6,394 | 5,205,520 | 1,793 | 1,530,020 |
| Total..... | 12,311 | 8,996,112 | 2,520 | 1,652,590 | 12,917 | 9,905,625 | 2,683 | 1,843,943 | 12,717 | 10,456,790 | 2,460 | 1,869,970 |

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The firm has built the following vessels since 1908:

| | | Tons. | Length, feet. |
|-------|-----------------------------------|--------------|---------------|
| 1913* | S.M.S. "Markgraf," battleship | 26,500 | 580 |
| 1914 | " " "Regensburg," light cruiser | 5,000 | 465 |
| 1911 | " " "Strahlsund," light cruiser | 4,900 | 446 |
| 1911 | " " "Magdeburg," light cruiser | 4,900 | 446 |
| 1906 | " " "Gneisenau," armoured cruiser | 11,500 | 469 |
| 1909 | " " "Thüringen," battleship | 22,650 | 546 |
| 1908 | " " "Westfalen," battleship | 18,750 | 478 |
| 1908 | S.S. "Berlin," for N.D.L. | 19,200 gross | 612 |
| Bldg. | S.S. " " " " | 18,000 " | " |

and many smaller merchant vessels.

DOCKS AND REPAIR CAPACITY.

The firm owns three floating docks, the details of which will be found on page 34.

Another floating dock was projected in 1911, which was to have a lifting capacity of 20,000 tons.

MACHINE SHOPS.

The yard has numerous shops, all fitted with the latest machinery.

LIGHTING AND POWER.

There are two power houses in the yard, and these provide electric and compressed air power and electric light.

COMMUNICATIONS.

Branch railway lines connect nearly all the machine shops and the slips with the main line.

Atlas Werke.

This small shipyard lies to the southwestward of *Hafen I*. It undertakes the building and repair of small merchant vessels.

Norddeutsche Hütte.

A company, named the "Norddeutsche Hütte A.-G.," has been formed under the auspices of the North German Lloyd Steamship Company. The Company has erected blast furnaces and a steel rolling mill near *Ostleibshausen*, chiefly for the production of pig iron for export, and cast iron and steel for shipbuilding purposes.

THE TOWN.

Bremen stands on both sides of the *Weser River*, that part which is on the right bank being the *Alt Stadt* (old town), and the so-called *Neu Stadt* (new town) stands on the left bank on both sides of the *Kleine Weser*, which is a cul-de-sac remains of a branch of the main stream.

It is one of the Hansa towns, *i. e.*, a free republic governed by an elected Senate and a second house, consisting of members elected from the free burghers of the city.

The first charter was granted to the Anglo Saxon Bishop of Bremen, *Willehad*, in A. D. 788, and by further advances the town (assisted by *Hamburg*) gradually became, after many vicissitudes (such as being incorporated with *Sweden*, becoming a *Duchy*, with part of *Hannover* and *Oldenburg*), a separate state, under the suzerainty of the German Emperor.

It was surrendered to Napoleon I in 1810, but in 1813 it regained its freedom, and became, as it is now, a republic under the protection and suzerainty of the *King of Prussia*.

It covers an area of about 2,187 acres, *i. e.*, nearly 3½ square miles, and the population in 1910 (last census) was 247,347, an increase of 2.8 per cent since the previous census (1900).

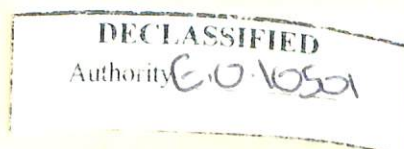
The republic embraces a much larger area.

The older parts of both the old and new towns were surrounded by a wall and moat; the walls are now gardens, and the new town moat is nearly filled, except at each end, where it has been converted into basins for the port.

Those parts of the old and new towns which are within the walls are known as the *Inner Old* and *New Towns* (Innere Altstadt and Innere Neustadt).

Buildings and Hospitals.

The *Cathedral* (commenced in A. D. 1044, enlarged in the 12th century, again enlarged in 1522, spires added in 1628, burnt in 1740, restored in 1756, and finally rebuilt in 1888) stands in the Inner Old Town, about 500 yards N.N.E. of the *Grosse Weser Brücke*, the bridge furthest upstream of the three which join the Old and New Towns. It has two pointed steeples at the west end and a small octagonal tower at the east end.



In the following description of the positions of the principal buildings of the city, the bearings (to the nearest point) and the distances (in yards or statute miles) are given from the cathedral.

N.N.E.

R. C. *Seminary*, 200 yards; two large *hotels*, 650 and 700 yards; *Light railway station* (Tarmstedt Light Railway), 1,500 yards.

N.E. b. W.

Cathedral Hof, 100 yards; a large *school*, 620 yards; *theatre*, 770 yards. N.E. b. N., two *schools*, 600 and 800 yards; southeast corner of the *Bürger Park*, 1,620 yards; *electric power house*, 1,880 yards.

N.E.

Office of Weights and Measures, 150 yards; *St. Remberti Church*, 750 yards; *seminary*, 800 yards.

E.N.E.

Large *hotel*, 250 yards; *theatre*, 320 yards; *school*, 800 yards; *seminary*, 1½ miles; a large *entertainment hall*, 1¾ miles; *post office*, 1½ miles; *school*, 2 miles.

E. b. N.

Schools at 700 and 1,200 yards; *electric power station*, 800 yards.

E.

Seminary (ladies'), 100 yards; *casino*, 950 yards; *post office*, ¾ mile; *church*, 1 mile; *deaf and dumb institute*, 1½ miles; the centre of the *City Hospital* grounds (a very large collection of buildings, with a total accommodation for 767 patients, with operating theatres and a walled-off section for lunatics), 1½ miles.

E. b. S.

School, 950 yards; *school and seminary*, 1½ miles; *police station*, 1¼ miles; large *orphanage*, 1¾ miles (about 250 yards to southwards of orphanage, a large *amusement hall*).

E.S.E.

Institute for the Blind, ¾ mile; *school, police, and fire station*, ¾ mile; *new weir* (Weser River), 1,880 yards.

S.E. b. E.

Prison, 530 yards; *ferry* (Weser River), ¾ mile.

S.E.

Law courts, 200 yards; large *school*, 270 yards; *military manœuvre ground*, 1 mile. This is a grazing ground, which belongs to the cathedral. In winter it occasionally becomes flooded.

S.S.E.

Principal *post office*, 160 yards; *technical school*, 270 yards; *ferry*, 600 yards.

S. b. E.

Water works, ½ mile; *school*, 1 mile.

S.

School, 170 yards; *police station*, ¾ mile; *St. Jacobi Church*, 1 mile.

S. b. W.

St. Johannis Church, 230 yards.

S.S.W.

College, 870 yards; *Red Cross hospital*, 920 yards; *school*, 1,200 yards; *rifle range*, 1½ miles.

S.W. b. S.

School, 770 yards; *church*, 1,400 yards; *school*, ¾ mile.

S.W.

Cotton exchange, 200 yards; *Grosse Weser Brücke (Bridge)*, 400 yards; *workhouse*, 550 yards; *Neue Kleine Weser Brücke (Bridge)*, 630 yards; *St. Paul's Church*, 720 yards; *school*, 1,000 yards; *house of garrison commandant*, ¾ mile; *rubber factory*, 1¼ miles.

S.W. b. W.

New savings bank, 170 yards; *Alte Kleine Weser Brücke (Bridge)*, 600 yards; *police and fire station*, 840 yards; *barracks*, 1,200 yards; *military hospital*, 1,400 yards.

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W.S.W.

Bourse, 75 yards; *St. Martin's Church*, 320 yards; *Barracks and School*, 850 yards; *Technical Schools*, ¾ mile; *Seminary*, 1 mile; *Brick-yard*, 1¾ miles.

W. b. S.

Bremer Bank, 210 yards; *School*, 380 yards; *Customs House*, 1,450 yards; *Fire Station*, ¾ mile; *School*, 1,650 yards; *New Gas Works*, 1½ miles; *Brick Works*, 1¾ miles.

W.

South end of the *Kaiser Brücke (Bridge)*, ½ mile; *Large Seminary and Post Office*, ¾ mile. *Coal Stores* (Sicherheits Hafen), 1 mile.

W. b. N.

Bank, 200 yards; *Neu Stadt Railway Station*, ¾ mile; *Customs House*, 1,580 yards; *Footbridge over the Woltnershauser Kanal* 1¼ miles; *School*, 1¾ miles; *Post Office*, 1¾ miles.

W.N.W.

Council House, 100 yards; North end of the *Kaiser Brücke (Bridge)*, 720 yards; *Old Corn Exchange*, ½ mile; *St. Stephen's Church*, 1,200 yards; *School*, 1,450 yards; *Almshouse*, ¾ mile; *Weser Railway Station*, 1,650 yards; *Petroleum Refineries*, 1½ and 1¾ miles; *Church*, 2½ miles.

N.W. b. W.

St. Ansgari Church, 500 yards; *Orphanage and Head Customs House*, 700 yards; *School* 1,200 yards; *Post Office*, 1 mile; *Power House and Harbour Offices*, 1½ miles; *Locomotive Shed*, 1¾ miles; *Power House*, 2 miles.

N.W.

Electric Power House, 340 yards; *N.D.L. Offices*, 420 yards; *Head Customs Office*, 600 yards; *Police Station*, 700 yards; *School*, 780 yards; *Post Office*, 1,250 yards; *Schools*, ¾ and 1¼ miles; *St. Willhadi Church*, 1¾ miles; *St. Mary's Church*, 1½ miles (close by is a large *Orphanage*); two *Petroleum Refineries*, 2¼ miles; another 2½ miles.

N.W. b. N.

State Bank, 560 yards; *Principal Fire Station*, 1,100 yards; *St. Michael's Church and School*, 1,400 yards; *Police Station*, 1 mile; *Post Office*, 1¾ miles; *Police Station and School*, 1¾ miles; *Post Office*, 2½ miles.

N.N.N.W.

National Bank, 130 yards; *School*, 1¾ miles.

N. b. W.

Deutsche Bank, 150 yards; *Secondary School*, 250 yards; *Steel Tube Factory*, ¾ mile.

N.

City Library, ½ mile; *Goods Station*, ¾ mile; *Locomotive Sheds*, ¾ mile; *Electric Power House* 1,400 yards; *Slaughter House*, 1,500 yards; *Hemm Railway Station*, 1¾ miles (Light Railway)

N. b. E.

Museum, 150 yards; Fourteen large *Hotels* between 600 and 700 yards; *Principal Railway Station* (Haupt Bahnhof), 950 yards; *Old Gas Works*, 1,100 yards; *Electric Power Station*, 1,400 yards; S.W. corner of the *Bürger Park*, 1,800 yards.

Open Spaces.

In the Inner Old Town the so-called *Markt* (Market Place) and the *Cathedral Hof* are the only open spaces, but the moat is flanked by gardens for the whole of its length.

In the Outer Old Town there is a large open space to the southward of the main *Railway Station*.

In the Inner New Town the *Neuer Markt* (New Market Place) which lies to the northward of the barracks is the only open space.

The Outer New Town consists largely of scattered buildings, and open spaces exist everywhere.

Lighting and Power.

The town is lit by both electricity and gas, most of the main streets by the former, as also the better houses and public buildings.

The *Power Stations* are described under the "Commercial Port," page 34.

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Water.

The city has an excellent supply of water which is drawn from the Weser.

The *Waterworks* (S., 1/2 mile from Cathedral) are provided with a great many filtering beds with a total area of 15,550 square yards.

The *Water-tower* is the largest building of the waterworks and on its ground floor are the pumping engines, the boiler-house being about 20 yards to the eastward. The water-tower tanks (2) hold together 1,675 tons of water.

Internal Communications.

ACROSS THE RIVER.

There are three regular ferry services which leave the north bank at the following points:

- (1) S.E. b. E., 3/4 mile from the Cathedral.
- (2) S.S.E., 600 yards " "
- (3) W.N.W., 1 1/2 miles " "

TRAMWAYS.

Electric tramways intersect the city in all directions. They are shown on Plan 13.

COMMUNICATIONS.

Bremen is nominally the headquarters of the Norddeutscher Lloyd (N.D.L.), the second largest shipping company in the world, though actually, owing to the fact that the bigger steamers are unable to use the port of Bremen, it is at *Bremerhaven* that the real head office exists (see page 17).

The following companies either belong to Bremen or their vessels call there:

- Argo Line (*Bremen*).
- Baltischer Lloyd (*Libau*).
- Deutsche Ost-Afrika Line (*Hamburg*).
- Finska Angfartygs Aktiebolaget (*Helsingfors*).
- Deutsche Levant Linie (*Hamburg*).
- Hansa Line (*Bremen*).
- Hamburg-Amerika Linie (*Hamburg*).
- Jensen and Söner (*Helsingborg*).
- Kosmos Line (*Hamburg*).
- Neptun Line (*Bremen*).
- Oldenburg-Portug. D. und R. Aktiengesellschaft (*Oldenburg*).
- Rickmers Reismühlen und Reederei A.-G. (*Bremen*).
- Roland Line (*Bremen*).
- Sartori und Berger (*Kiel*).
- Schleppschiffahrtsgesellschaft Unterweser (*Bremen*).
- Teutonia Line (*Gothenborg*).
- Woermann Linie (*Hamburg*).
- Worms & Co. (*Håvre*).

The following *British* companies make Bremen a port of call for some of their services:

- Donald Currie (*Liverpool*).
- James Currie & Co. (*Leith*).
- Royal Mail Steam Packet Co. (*London*).
- Union Castle Line (*London*).

TABLE OF SAILINGS FROM BREMEN AND THE LOWER WESER POINTS.

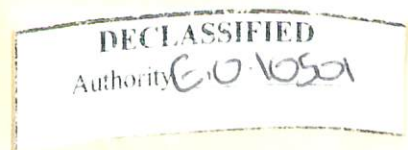
| Company. | Ports of call. | Terminal port. | Remarks. | |
|-----------------------------------|----------------|------------------|---|-------------------------|
| Norddeutscher - Lloyd (N. D. L.). | | Libau..... | Every 10 to 14 days. | |
| | | Hamburg..... | Twice weekly. | |
| | | Emden..... | Fortnightly. | |
| | | Southampton..... | Twice or thrice weekly. | |
| | | Rotterdam..... | Monthly. | |
| | | Boulogne..... | Irregular. | |
| | | Cherbourg..... | Twice weekly. | |
| | | Vigo..... | Fortnightly. | |
| | | Madeira..... | " | |
| | | Naples..... | Fortnightly. Alternate steamers do not call at Gibraltar. | |
| | | Gibraltar..... | Port Said..... | Three times per mensem. |
| | | | New York..... | Tuesdays and Saturdays. |
| | | Baltimore..... | Every 8 days. | |

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| Company. | Ports of call. | Terminal port. | Remarks. |
|---|---|---|----------------------|
| Norddeutsche-Lloyd (N. D. L.)—cont. | Emden, Philadelphia..... | Galveston and Baltimore alternately. | Fortnightly. |
|  | ..... | Galveston..... | Monthly. |
| | Emden, Boston..... | New Orleans..... | Every 2 or 3 weeks. |
|  | ..... | Cuba..... | 10th of every month. |
| | Emden, Rotterdam..... | Quebec or Montreal. | Every 3 weeks. |
| | Emden, Leixoes, Lisbon, Pernambuco, Bahia, Rio de Janeiro. | Santos..... | Fortnightly. |
| | Emden, Montevideo, Buenos Aires (but Rio de Janeiro on homeward trip). | La Plata..... | " |
| | Port Said, Suez, Colombo, Penang, Singapore, Hong Kong, Shanghai. | Tsingtau (sometimes Yokohama). | Monthly. |
| | Port Said, Suez, Colombo, Singapore, Hong Kong, Shanghai, Tsingtau, Kobe, Yokohama. | Moji..... | Fortnightly. |
| | Emden, Port Said, Suez, Aden, Colombo, Fremantle, Adelaide, Melbourne. | Sydney..... | Every 4 weeks. |
| Melbourne (Hobart occasionally), Sydney (Newcastle occasionally). | Brisbane..... | Fortnightly. | |
| In conjunction with Roland Line. | ..... | Antwerp..... | 2 or 3 times weekly. |
| In conjunction with Neptun Line and Oldenburg-Portugal Line. | Emden, Oporto..... | Lisbon..... | " " |
| In conjunction with Hamburg Amerika Linie. | Emden..... | St. John (N. B.) or Portland (Maine). | Monthly. |
| Neptun Line..... | ..... | Amsterdam..... | Monthly. |
|  | ..... | Rhine ports..... | Every 4 days. |
|  | ..... | Stockholm..... | Fortnightly. |
|  | ..... | Riga..... | " |
|  | ..... | Copenhagen..... | Every 3 or 4 days. |
|  | ..... | Danzig..... | Weekly. |
|  | ..... | Königsberg..... | " |
|  | ..... | Trondhjem..... | Fortnightly. |
|  | ..... | Aalborg..... | Monthly. |
|  | ..... | Rosario..... | Alternate Saturdays. |
| Hansa Line..... | In conjunction with H. A. L. | Hamburg, Rotterdam, Antwerp, (occasionally Middlesbrough), Port Said, Suez (Red Sea ports if cargo), Colombo, Madras, Calcutta. | Chittagong..... |
|  | ..... | Same as above to Red Sea ports, then Bombay, Karachi. | Mormugoa..... |
|  | ..... | Hamburg, Antwerp, Bassein, Moulmein, Akyab. | Rangoon..... |
|  | ..... | Calicut..... | Cochin..... |
|  | ..... | Rotterdam, Tenerife, Las Palmas, Konakry, Cape Palmas, Sekondi, Quitta, Lome, Danoe, Grand Popo, Whydah. | Kotonou..... |
|  | ..... | Antwerp, Southampton, Las Palmas, Tenerife, Swakopmund. | Lüderitzbucht..... |
|  | ..... | Rotterdam, Antwerp, Sandy Point, Corral, Coronel, Talcahuano, Valparaiso, Coquimbo, Taltal, Antofagasta, Tocopilla, Iquique, Arica, Mollendo. | Callao..... |
|  | ..... | Antwerp, Port Sudan, Jibuti, Muskat, Bander Abbas, Lingah, Barein, Beshire, Mohammera, Awaz, Bazra. | Bagdad..... |
|  | ..... | Rotterdam, Tenerife, Las Palmas, Konakry, Cape Palmas, Sekondi, Quitta, Lome, Danoe, Grand Popo, Whydah. | Kotonou..... |
|  | ..... | Hamburg, Dalny, Vladivostok..... | Nikolaijevsk..... |

And many minor companies, and other sailings of the principal companies.

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There is railway connection between *Harburg* and *Hamburg*.

(2) This line runs from *Bremerhaven* (Geestemünde) through *Wulsdorf* and *Bremervörde* to *Stade*.

The portion from *Bremerhaven* to *Bremervörde* is described on page 18, under "Bremerhaven—Communications."

From *Bremervörde* E. b. S. and E.N.E. 13½ miles to *Deinste*; thence N.N.E. 5 miles to *Stade*, where it joins (1).

(3) This line goes from *Bremen* through *Oberneuland*, *Rotenburg* and *Buckholz* to *Harburg* and *Hamburg*.

From *Bremen* E. b. S. 11 miles to *Sagehorn*; thence E. b. N. 15½ miles to *Rotenburg*; N.E. 22½ miles to *Buckholz*; and N.N.E., E. and N. 15½ miles to *Harburg* (see (1)).

(a) and (b) branch lines are described under "Vege sack and Bremerhaven," pages 18 and 29, respectively.

(c) This branch line leaves the main line at *Stade* and runs N. 6¼ miles to *Barnkrug*; N.W. and N.N.W. 10 miles to *Wischhafen*; N., N.W. and W. b. N. 3¾ miles to *Holler*; N. 1¾ miles to *Freiburg*; W. 6¾ miles to *Baljerdorf*; S. ¼ mile to *Süderdeich*; W.N.W. 1¾ miles to *Hörne*; S. 1¾ miles to *Itzörden*.

(d) This line branches from the central railway 3¼ miles E. b. S. of *Bremervörde* near a small village called *Hesedorf*; thence E. b. S. 12¼ miles to *Harsefeld*; thence it runs in a winding southeasterly course about 19 miles to *Buchholz* (see (3)); thence to *Harburg*.

(e) This branch leaves the central line 1 mile S.E. of *Bremervörde* and runs S. b. E. 14¼ miles through *Bevern* and *Selsingen* to *Zeven*; S.S.E. 5 miles to *Elsdorf*; S. 8¾ miles to *Waffensen*; and joins the southern line 1 mile W. of *Rotenburg*.

This line is to be extended to the northward from *Bremervörde* via *Bederkesa* and *Altenwalde* to *Cuxhaven*.

Roads.

There are innumerable good roads throughout this district, those in the northern part being mostly raised above the low-lying land by embankments.

These embankments are, in many cases, the remains of sea dykes which have been left inland by the continued reclamation of the watts which skirt the coast.

The principal roads are:

- (a) From *Bremen* via *Bremerhaven* to *Cuxhaven*.
- (b) From *Cuxhaven* to *Harburg* and *Hamburg*.
- (c) From *Bremerhaven* to *Harburg* and *Hamburg*.
- (d) From *Bremen* to *Harburg* and *Hamburg*.

Road (a) is described on page 18 under "Bremerhaven," as also are the adjacent roads.

(e) From *Cuxhaven* a winding road generally in an east-southeasterly direction to *Otterndorf* (11 miles*), thence E.N.E., E.S.E. and S. to *Kadenberge* (19½ miles), S.E. to *Himmelpforten* (34¾ miles), S.E. and E. to *Stade* (42¾ miles), S.S.E. to *Horneburg* (51 miles), S.E. to *Buxtehude* (56½ miles), N.E., S.E. and E.N.E. to *Fischbeck* (62½ miles), E. to *Harburg* (69 miles).

There is a road between *Harburg* and *Hamburg*.

(c) This road is described as far as *Bremervörde* (88¼ miles) on page 18, under "Bremerhaven."

From *Bremervörde* S.E. to *Hesedorf* (3 miles), E.N.E. and E.S.E. to *Grosse Aspe* (8¼ miles), E. to *Bargstedt* (3¼ miles), N.E. to *Horneburg* (13 miles), thence as (b) to *Harburg*.

(d) From the Cathedral, *Bremen*, E.S.E. to *Hemelingen* (3½ miles), E. to *Bassen* (12 miles), N.E. to *Ottersberg* (16 miles), E. to *Rotenburg* (27½ miles), N.E. through *Schlessel* (33 miles), and *Tostedt* (40½ miles) to *Harburg* (63½ miles).

Canals.

There are two canals in this district, both of which connect the *Weser* River with the mouth of the *Elbe*.

- (1) *Hadelner Canal*.
- (2) *Oste-Hamme Canal*.

The *OSTE-HAMME CANAL* is only a shallow moor canal which is very nearly dry in summer. It connects the *Hamme*, a tributary of the *Lesum River* (see under "Vege sack," page 29) with the *Oste*, a small river which debouches into the estuary of the *Elbe* at *Neuhaus*.

*The distances are given, in statute miles, from the place of departure of the road.

This river, which has been more or less canalized, is navigable at M.L.W.S. for vessels drawing 4¼ feet as far as *Bremervörde* (38½ nautical miles from the mouth of the river). (Springs rise 5¾ feet.)

Vessels drawing 7½ feet can reach *Neuhaus* (3½ nautical miles) at M.L.W.S. (Springs rise 12¼ feet.)

NEUHAUS.

This town has a small harbour, on the left bank of the river, which covers an area of about ¼ acre, and which has a wharf 164 feet long.

There is a hand crane on the wharf which is capable of lifting a load of 1 ton.

There is also a small *Shipbuilding Establishment* where small canal and fishing craft are built.

THE ELBE RIVER.

(See Maps 8 and 8B.)

The *Elbe*, which rises in *Bohemia* (Austria), is one of the largest rivers of Europe. It is navigable by vessels of 25 feet draught at M.L.W.S. as far as *Hamburg* (see page 49), 75 nautical miles from the sea. Vessels of 8¼ feet draught can reach *Hoopte*, 87 nautical miles; of 4¼ feet, *Wallwitzhafen*, 270 nautical miles; and of 3 feet, the confluence of the *Moldau River*, 467¼ nautical miles from the sea.

The *Moldau* is navigable by vessels of 3 feet draught as far as *Stechowitz*, a further 45¼ nautical miles.

Entrance.

Unlike the other rivers of this coast, the *Elbe* has only one entrance from the sea which is practicable for large vessels.

It is entered on an E. b. S. course for about 8 miles,* thence East-South-Easterly to about 17 miles, than S.S.E. to about 19¼ miles, when *Cuxhaven* is reached.

As far as *Cuxhaven* there is nowhere less than 33 feet of water at M.L.W.S., the springs rise being about 11 feet in these reaches.

Thence the channel gradually bends round to the eastward until a northerly course and the confluence of the *Oste River* (left bank) is reached (30¾ miles) (see above).

Secret Channels.

It is reported that there are two channels "suitable for ships of moderate draught" to the northward and eastward of the *Medem Sands* which would allow such vessels to pass at a considerable distance (about 7,000 yards) from the *Cuxhaven* batteries.

It is evident that this report is true, for it is known that provision was made for mining these channels in war time, and it has been reported that a battery was to be built near *Otterndorf* which would command their junctions with the main channel of the *Elbe*.

It is certain that these channels are not navigable except with the assistance of a special pilot, the ordinary *Elbe* pilots, though they suspect their existence, being ignorant of their courses and depths.

It is believed that German warships are periodically informed as to the changes in the channels, which are constantly shifting, for it is reported that they use them occasionally.

The latest report received on this subject is as follows:

The two channels which lead S.E. from the *Klotzen Loch* running respectively between *Grosse Medem Sand* and the *Kleine Medem Sand*, and between the *Kleiner Medem Sand* and *Neufelder Watt*, are constantly altering in position, outline, and depth.

The minimum depth at M.L.W.S. is 8 feet in the former and 13¼ feet in the latter channel.

The eastern channel appears to be the deeper and straighter, the least water being, in both channels, near the southeastern ends.

MOUTH OF THE OSTE TO HAMBURG.

NEUFELD.

On the right bank of the *Elbe*, at about 31 miles, there is a small commercial port with a harbour covering about 2½ acres called *Neufeld*.

*The distances are given in nautical miles from the open sea (Outer *Elbe* Light Vessel.)

There is a *quay* here 1,050 feet long, on which is a 3-ton *crane* (? power).
At M.H.W.S. vessels drawing 8½ feet can enter the harbour. The *depth* in the harbour itself is not known.
There is a *Post and Telegraph Office*, but no telephone, here.

BRUNSBÜTTEL.

At 35 miles,* right bank, is the small port of Brunsbüttel, the irregularly shaped *harbour* of which covers an area of 5¼ acres.

The *quays* have a total length of 755 feet and there is one 3-ton hand *crane*.

The *depth* in the harbour is not known, but vessels drawing as much as 12 feet can enter at M.H.W.S.

There is a small *Shipbuilding Establishment* here where small canal and river vessels are constructed and repaired.

Brunsbüttel has a *Post and Telegraph Office*, a *Customs House*, and a *Railway Station*.

BRUNSBÜTTELKOOG.

This is the entrance to the Kaiser Wilhelm Canal (Section 5). It is 35 miles from the open sea.

FREIBURG.

At 43¼ miles. This is a small port only attainable at high water for river and canal craft. There is an establishment for building these vessels with a *wharf* 375 feet long. A *Post and Telegraph Office* and a *Railway Station* exist here.

GLÜCKSTADT.

(See Plate 7.)

This is a small port on the right bank at 47½ miles.

ENTRANCE.

It is entered through the *Glückstädter Fahrwasser*, which is a small channel between the Rhyn Plate (a shoal) and the right bank of the Elbe.

From the *Fahrwasser* the Aussenhafen is entered direct, the depth at M.L.W.S. as far as the Aussenhafen being 16 feet.

BASINS.

There are two basins, the *Aussenhafen* and the *Binnenhafen*, the first being tidal and the second nontidal, the total area being 18½ acres.

The *Aussenhafen* is 1,510 feet long, and of an average width of 280 feet, its depth at M.L.W.S. varying from 2½ feet to 7½ feet (springs rise 10¾ feet).

This basin lies in an E. b. N. and W. b. S. direction and the small river *Rhyn* runs into its S.E. corner.

The northern quay is served by a branch of the railway; the southern side of the basin dries at low water.

The *Binnenhafen*, which lies in approximately the same direction, is 1,970 feet long and 220 feet average width. Its depth varies from 6½ feet to 1¾ feet, the greatest depth being at the centre and the least at the head of the basin.

It is entered from the Aussenhafen through a dock gate.

This dock gate is fitted with an extra pair of valves for use when the river rises abnormally, these extra valves being somewhat higher above high water than the ordinary gate. When these so-called "Floodgates" are shut it is impossible to enter or leave the *Binnenhafen*.

The ordinary gates are opened 1½ hours before high water and closed at high water.

When open the entrance is 45 feet wide and the sill is 18¾ feet below M.H.W.S. in the centre, the sill being semicircular in vertical athwartship section and thus there is less water at the sides.

The northern side of the *Binnenhafen* is a succession of quays which are served by the same branch of the railway as those of the *Aussenhafen*.

QUAYAGE.

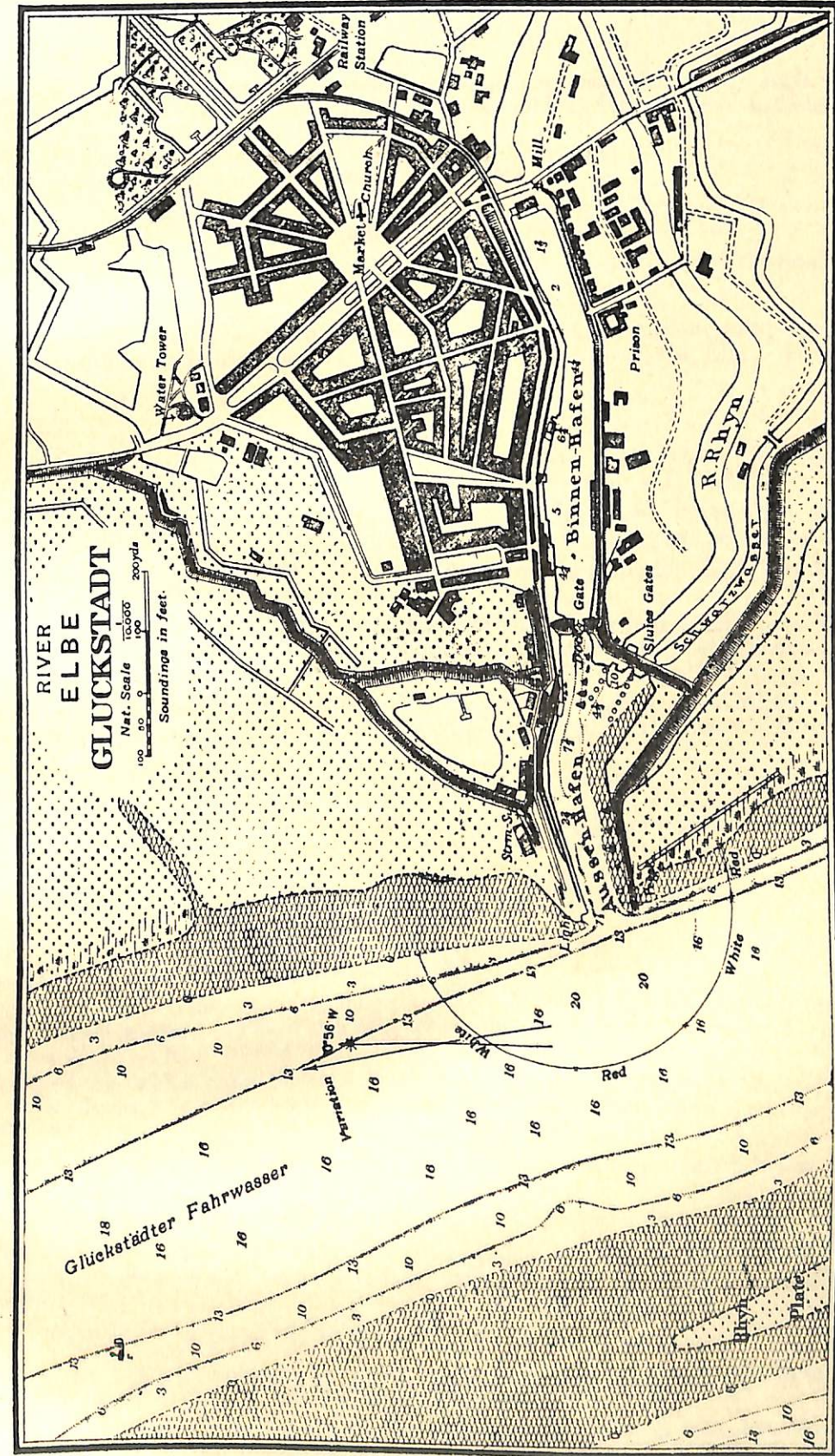
The total quayage in Glückstadt harbour is 1,845 feet; the depths alongside are as given above for the basins.

LIFTING APPLIANCES.

On the quays there are the following cranes:

- 1 hand crane of 5 tons capacity.
- 1 " " " 1½ " "
- 2 steam cranes " 1½ " "

* Distance in nautical miles up the river from the open sea (Outer Elbe Light Vessel).



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COAL.

There are two coal stores on the N. quay of the outer harbour. In 1912 about 3,200 tons of coal were seen.

Coal is placed on board by means of trollies, containing about 5 cwt. each, which run on overhead rails from the stores to the quay side, and are then lifted by the two steam cranes and tipped on board.

SHIPBUILDING AND REPAIRING.

There is an establishment for building and repairing canal and river craft. There are several slips on which vessels up to 65 feet in length and 21 feet in breadth have been built.

COMMUNICATIONS.

There are steam ferries to *Krautsand* and *Wischhafen*.

The main railway from *Hamburg* (Altona) to *Itzehoe* (Main line (4)) passes through *Glückstadt* (see under—"Holstein—Communications," Section 5).

The main roads are described under "Holstein—Communications," Section 5.

DEFENCES.

At *Glückstadt* it is believed that there are arrangements for obstructing the channel of the Elbe by sinking ships right across it (see under "Defences of the Elbe," Section 4).

THE KRÜCKAU RIVER.

At $53\frac{1}{2}$ miles is the confluence of the Krückau River, right bank. This river is navigable for a distance of $6\frac{1}{4}$ miles by vessels drawing $4\frac{1}{4}$ feet at M.L.W.S.

At this distance from the confluence is the town of *Elmshorn*, where there are *quays* on both sides of the river, that on the right bank being 1,215 feet long and served by the railway.

That on the left bank is 990 feet long and the depth alongside both quays is $7\frac{1}{2}$ feet M.L.W.S. ($16\frac{1}{2}$ feet M.H.W.S.)

There are two firms which can build and repair small river and canal boats at Elmshorn and two others on the right bank of the river about half-way between Elmshorn and the Elbe.

There are a *Post and Telegraph Office* and a *Railway Station* at Elmshorn, the railway being the main line from *Hamburg* (Altona) to *Itzehoe* (see "Holstein—Communications," Section 5).

GRAUERORT.

At Grauerort, $54\frac{1}{2}$ miles, left bank, there is a *fort* just behind the river-dyke. It is described in Section 4 under "Defences of the Elbe."

THE PINNAU RIVER.

The Pinnau runs into the Elbe at 56 miles on the right bank and is navigable for a little over 6 miles, to *Ütersen*, by vessels drawing $4\frac{1}{4}$ feet at M.L.W.S.

There is a steel *bridge*, about $3\frac{1}{2}$ miles up the river, which has four arches, the two centre ones being fitted to open. The width of the openings is 38 feet and the height of the bridge above mean high water is 15 feet.

At *ÜTERSSEN*, which extends for a distance of $1\frac{1}{4}$ miles on the right bank of the Pinnau, there are two *quays*, one at the lower end of the town, 370 feet long, and the other at the upper end, 605 feet long.

There is a *Cement Factory* on the left bank opposite the town which has a small private wharf.

In the town itself there are two canal and river *Boatbuilding and Repairing Establishments*.

There are also a *Post and Telegraph Office* and a *Railway Station*, the railway being a branch from the *Hamburg* (Altona)—*Itzehoe* main line (4) (see "Holstein—Communications," Section 5).

STADE (BRUNSHAUSEN).

STADE is a town (population 12,000) about $2\frac{1}{2}$ miles up the *Schwinge River*, which runs into the Elbe at *Brunshausen* (at $57\frac{3}{4}$ miles, left bank).

The whole of that part of the river Schwinge which lies between these two places has small *wharves* and *quays* on both banks, mostly used for loading barges with bricks, and alongside of these there are $6\frac{1}{2}$ feet of water at M.L.W.S. ($15\frac{1}{2}$ feet M.H.W.S.) at the lower end and 5 $\frac{1}{2}$ feet M.L.W.S. at the upper ones near Stade.

At the lower end of Stade is the *pier* of the Norddeutscher Tannery, on which there are two *cranes* (steam), capacity unknown.

At Stade there is a *basin* covering an area of $3\frac{1}{4}$ acres and quays 2,300 feet long on which there are four hand *cranes*, the largest of which has a capacity of $7\frac{1}{2}$ tons.



There are also two *piers* and a canal and river *Boatbuilding and Repairing Establishment*. There are *Post and Telegraph Offices* both at Stade and Brunshausen and Stade is on the coast *railway* and the Hörne branch line of Hadeln Land (*see* page 44).

The Hamburg-America liners *coal* off Brunshausen, generally from a hulk or from lighters sent from *Hamburg*.

A few of the larger vessels sometimes *coal* lower down the river (2nd class and steerage passengers embark here from tugs sent from *Hamburg*; 1st class passengers go by rail to *Cuxhaven* and embark there).

Near the railway station is a large enclosure surrounded by a parapet and marked "Artillery Depot."

TWIELENFLETH.

At this place, 59½ miles, left bank, it is believed that arrangements have been made for blocking the river Elbe by sinking vessels right across it (*see* under "Defences of the Elbe," Section 4).

LÜHE RIVER.

At 62¼ miles, left bank, the river Lühe runs into the Elbe. It is navigable as far as *Horneburg*, 6½ miles from its mouth, by vessels drawing 4 feet M.L.W.S. (13 feet M.H.W.S.).

About ¼ mile up this river, on the left bank, is Lühort, a village with two *piers* (164 feet of quayage) and three canal and river *Boatbuilding Establishments*.

At STEINKIRCHEN, 1 mile on left bank, there is a *Post and Telegraph Office*. At this place the river is crossed by a wooden *drawbridge* with an opening of 21 feet wide.

After passing three fixed wooden *bridges*, with a minimum opening of 17½ feet wide and 7¼ feet high (above M.H.W.S.), *Horneburg* is reached.

HORNEBURG lies on the left bank and there are 328 feet of *quayage* and one hand crane, capacity unknown.

There are a *Post and Telegraph Office*, *Telephones*, and a *Railway Station* at *Horneburg*, which is on the coast railway of Hadeln Land (*see* page 43).

SCHULAU (WEDEL).

(*See* Plate 8, page 52.)

At 65 miles, right bank, there is a small *basin* close to the small village of Schulau.

BASIN.

This basin covers an area of about 4½ acres and varies in depth, at M.L.W.S., from 8 to 5 feet. It is entered, direct from the Elbe, between two short *piers*.

It belongs to Glückstadt, and 492 feet of its sides are fitted with wharves, the remainder being sloping.

SHIPBUILDING AND REPAIRING.

Just to the west of the basin is an establishment for building and repairing canal and river craft.

DYNAMITE STORE AND POWDER FACTORY. (*See* Plate 8, page 52.)

About 6 cables to the eastward of the entrance to the basin there is a dynamite store house which stands close to the river bank in front of a large *Sugar Refinery*.

About 6 cables above the Dynamite Store and just to the eastward of *Billerbeck Leading Light* is a small basin belonging to the Vacuum Oil Company.

There is only about 3 feet of water at M.L.W.S. in the entrance to this basin, which is about 130 feet long and 60 feet broad.

A branch of the railway connects this basin with the works and the Wedel branch line (*see* Holstein—Communications," Section 5).

Between the Sugar Refinery and the Vacuum Oil Company's works and about 400 yards inland there is a large Powder Factory.

This factory has a small pier, connected with it by a light railway, alongside of which there are 18 feet of water at M.L.W.S.

COMMUNICATIONS.

Railway.

There is a railway station at Wedel, a small town about ¾ mile to the northward of Schulau, this being a terminus of the Wedel branch line (*see* "Holstein—Communications," Section 5).

The Post and Telegraph Offices are in Wedel, but there is Telephone communication at Schulau.

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THE ESTE RIVER.

On the left bank, at 69 miles, the Este runs into the Elbe at *Cranz*.

This river is navigable for vessels drawing 5¼ feet as far as *Buxtehude* (6¾ miles) at M. L. W. S.

At CRANZ there is a small *harbour* which consists of a widening of the river mouth on the right bank.

On the left bank at this point there are 197 feet of *wharf* with 6½ feet M. L. W. S. alongside and also a *pier* for river steamers.

About ¼ mile further up the river there are three *piers* and two canal and river craft *building establishments*.

At 3¼ miles there is a steel *swing bridge* the opening of which is 38½ feet wide.

At 3½ miles at *Estebrügge* there is a wooden double *swing bridge* with an opening 26¾ feet wide.

At BUXTEHUDE (both banks) there is a *basin* 39½ acres in area with 1,970 feet *quayage* on which there are two hand *cranes*, capacity unknown.

There is also a small *pier* for river steamers and ferries.

At *Cranz*, *Estebrügge*, and *Buxtehude* there are *post and telegraph offices* and at the last place a *railway station* on the coast railway of Hadeln Land (*see* page 43).

BLANKENESE.

Immediately opposite the mouth of the *Este*, on the right bank of the Elbe, is the suburb of *Hamburg* called Blankenese. It is in the province Holstein of Prussia.

From here the channel forks, the two branches being called the *Norder* and *Alte Süder Elbe*

These two channels embrace a group of about a dozen islands in and between which are most of the basins of Hamburg Harbour.

The Hansa Town Hamburg *port authority* controls the channels and banks of the *Norder Elbe* from its bifurcation with the *Alte Süder Elbe* until it rejoins it again.

That part of the river above the islands is called the *Ober* (Upper) *Elbe*.

HAMBURG AND ALTONA.

(*See* map 8B and plans 14 and 15.)

General Description.

HAMBURG, which with Altona forms the greatest commercial port on the continent of Europe, is a Hansa Town and with the surrounding districts and the territory called Ritzebüttel (on which stands *Cuxhaven*) forms the *Free State of Hamburg*, which covers an area of about 160 square miles, the population being estimated to be 1,167,000 for 1915; it was 1,014,700 in 1910.

ALTONA, which adjoins Hamburg on the western side, is not in the Free State but in the Prussian province *Holstein*.

It has a population of about 186,500 persons (1915) and is included, in this report, with Hamburg.

COMMERCIAL PORT.

(*See* plan 14.)

Position.

The port of Hamburg is on both banks of the *Norder Elbe* beginning at a point about 71 nautical miles from the open sea* and extending about 7½ nautical miles up the river.

It consists of a number of tidal basins nearly all of which are included in the "free area" for fiscal purposes.

Basins.

On coming up the Elbe the first basins to be met with are those on the island of *Finkenwerder*.

These are called "KANAL A," "KANAL B," "KANAL C," and "KANAL D," the first being the eastern one and the last the western.

* Outer Elbe Light Vessel.

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They all lie parallel to each other in a S. S. E. and N. N. W. direction and are all equal in length and breadth, but were not dredged to the proposed depth in July, 1914.

Their dimensions are:

Length, 3,180 feet.
 Breadth, 300 feet.
 Depth (proposed), A and B, 23 feet; C and D, 26½ feet.

These basins are to have stone quays on both sides.

Close to the eastward of the island of Finkenwerder there was a triangular group of islands, of which the largest (at the apex of the triangle and the most southerly) was *Waltershof*. This group lay between the two branches of the *Süder Elbe* called *Köhlfleth* and *Neuer Köhlbrand*.

The shallow channels between these islands are being transformed into basins and others on the islands themselves are being dredged.

Some of these basins were practically completed in July, 1914, and are shown as complete on plan 14. They are to be dredged to a depth of 33 feet M. L. W. S.

The remainder of the basins and canals were taken in hand in 1912, but it is not likely that they would take less than four years to complete.

To the eastward of the *Köhlbrand* are all the principal basins, and they all are included in the "free area" for fiscal purposes except the two *Kohlenschiff Hafens*.

In the harbour there are well over 40 miles of quaysage (see "Quaysage—Summary," opposite page), and about 100 miles of railway, and the "free area" (of which about 40 per cent consists of basins and canals) covers 2,563 acres, of which only about 20 acres are on the right (north) bank of the *Norder Elbe*. The warehouses cover some 60 acres.

Depths.

| Basin. | Depth at M. L. W. S. | Position. |
|---|----------------------|-------------|
| Neuer Kohlenschiff Hafen (not in free area) | ? ft. | Left bank. |
| Alter Kohlenschiff Hafen | 13½ to 21½ ft. | " |
| Kuhwerder Hafen | 23 ft. | " |
| Kaiser Wilhelm Hafen | 25 ft. | " |
| Ellerholz Hafen | ? | " |
| Ross Hafen | ? | " |
| Oder Hafen | ? | " |
| Schuten Hafen | ? | " |
| Flusschiff Hafen | ? 8 ft. | " |
| Schanzen Graben | 9 to 12 ft. | " |
| Fähr Kanal | 9 to 12 ft. | " |
| Mittel Kanal | 10 to 13 ft. | " |
| Guano Fleth | 12 to 15 ft. | " |
| Norder Loch | 9 to 14 ft. | " |
| Grevenhof Kanal | About 11 ft. | " |
| Reiherstieg | 10 to 16½ ft. | " |
| Werft Kanal | ? | " |
| Stüllhorner Kanal | 10 to 13 ft. | " |
| Quer Kanal | 8½ to 13 ft. | " |
| Stich Kanal | ? 11 ft. | " |
| Grenz Kanal | 8½ to 20 ft. | " |
| Alter Petroleum Hafen | 24 ft. | " |
| India Hafen | 26 ft. | " |
| Hansa Hafen | 26 ft. | " |
| Segelschiff Hafen | 22 to 25 ft. | " |
| Moldau Hafen | 12 to 13 ft. | " |
| Saale Hafen | 11 ft. | " |
| Spree Hafen | 11 ft. | " |
| Veddel Kanal | 11 ft. | " |
| Klütjenfelder Hafen | 10 to 11½ ft. | " |
| Sandthor Hafen | 16½ to 23 ft. | Right bank. |
| Grasbrook Hafen | 19 to 22 ft. | " |
| Strand Hafen | 18 to 20 ft. | " |
| Magdeburger Hafen | 13 to 18 ft. | " |
| Baken Hafen | 21 ft. | " |
| Kirchenpauer Hafen | 20 to 24 ft. | Left bank. |

Outside the "free area" there is only one basin of any consequence on the right bank:

| | | |
|--------------|--------------|-------------|
| Nieder Hafen | 18 to 20 ft. | Right bank. |
|--------------|--------------|-------------|

There are several other basins and canals outside the free area, but they all have less than 10 feet of water at M. L. W. S.

Quaysage.

Summary:

| Harbour. | Customs or free area. | Basin. | Length. | Depth alongside at, M. L. W. S. |
|--------------|-----------------------|--------------------------|---------|------------------------------------|
| Finkenwerder | | Kanal A | 4,800 | (Proposed) 23 |
| | | " B | 4,800 | " 23 |
| | | " C | 5,000 | " 26½ |
| | | " D | 4,600 | " 26½ |
| Waltershof | Zoll (customs) Hafen. | Jacht Hafen | 2,625 | ? 28 |
| | | Neuer Petroleum Hafen | 6,560 | ? 28 |
| | | Seeschiff Hafen I | 10,820 | Not completed. (33 ft. projected.) |
| | | " " II | 10,820 | ? 8½ |
| | | " " III | 10,820 | Not completed. |
| | | Park Loch | 5,580 | Not completed. |
| | | Rugenberger Hafen | 7,220 | ? 8½ |
| Köhlbrand | | Ewer Hafen | 8,530 | ? 8½ |
| | | Kuays on banks | 13,125 | Quays not completed. |
| Neuhof | | Neuer Kohlenschiff Hafen | 8,860 | ? |
| | | Alter Kohlenschiff Hafen | 7,875 | 13½ to 21 |
| Steinwerder | Frei (free) Hafen. | Kuhwerder Hafen | 6,560 | 23 |
| | | Kaiser Wilhelm Hafen | 7,775 | 25 |
| | | Ross Hafen | 5,250 | ? |
| | | Ellerholz Hafen | 4,265 | ? |
| | | Oder Hafen | 4,920 | ? |
| | | Flusschiff Hafen | 6,070 | ? 8 |
| | | Schuten Hafen | 1,410 | ? |
| | | Schanzen Graben | 885 | 9 to 12 |
| | | Fähr Kanal | 1,540 | 9 to 12 |
| | | Mittel Kanal | 1,980 | 10 to 13 |
| | | Guano Fleth | 2,625 | 12 to 15 |
| | | Quays on banks | 4,750 | 10 to 14 |
| | | Grenz Kanal | 6,560 | 8½ to 16½ |
| | | Alter Petroleum Hafen | 4,600 | 24 |
| Veddel | Frei Hafen | India Hafen | 5,775 | 26 |
| | | Hansa Hafen | 9,680 | 26 |
| | | Segelschiff Hafen | 9,680 | 22 to 25 |
| | | Moldau Hafen | 5,100 | 12 to 13 |
| | | Saale Hafen | 2,180 | 11 |
| | | Spree Hafen | 11,480 | 11 |
| | | Veddel Kanal | 5,050 | 11 |
| | | Klütjenfelder Hafen | 2,130 | 10 to 11½ |
| | | Neider Hafen | 2,130 | 16½ to 18 |
| | | Sandthor Hafen | 6,890 | 16½ to 23 |
| Alstadt | Frei Hafen | Grasbrook Hafen | 4,855 | 19 to 22 |
| | | Strand Hafen | 1,900 | 18 to 20 |
| | | Magdeburger Hafen | 1,180 | 13 to 18 |
| | | Baken Hafen | 7,875 | 21 |
| | | Kirchenpauer Hafen | 4,100 | 17 to 21 |

Nearly all the quays mentioned above are of stone, but in some cases the side of the basin is sloping at a steep angle. Where this is the case, dolphins are driven in at the foot of the slope and ships secure alongside the dolphins and communicate with the shore by long gangways or, in some cases, by piers which are built out as far as the line of dolphins.

In order to economize space, many of the basins have lines of dolphins driven in down the middle of the basins. Ships can lie alongside these and discharge cargo into lighters, of which there are an enormous number. Some of these lighters can carry as much as 2,000 tons.

Besides the quays mentioned above there are many floating landing stages on both sides of the river. The largest is that of the H. A. Linie, which is close on 1,500 feet long.

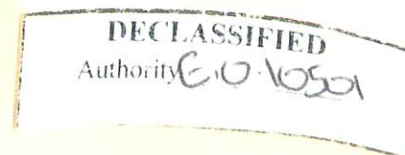
There are also about 3,280 feet of quaysage on the banks of the *Norder Elbe*. Practically every quay is served by the railways, the principal exceptions being the south quay of the *Kuhwerder Hafen*, both quays of the *Alte Petroleum Hafen*, and the north quay of the *Moldau Hafen*.

Lifting Appliances.

There are innumerable cranes of all sorts and powers on the quays—e. g., as shown in plate 8, page 52—the number being reported in 1913 as 620. There were also two electrically driven 150-ton cranes and two 250-ton cranes, also electrically driven (see plate 10, page 62).

Slips and Building Capacity.

See under "Private Shipbuilding Yards," pages 54-59.



Docks and Repair Capacity.

There are a large number of floating docks at Hamburg which belong to private shipbuilding companies (see page 56).

Besides these there are also the following dry docks and patent slips:

| Name. | Position. | Length over all. | Breadth, entrance. | Depth of sill. | Capacity, &c.. |
|-----------------------|---|------------------|--------------------|---------------------|----------------------------|
| Hamburg-Amerika..... | 150 yards east of mouth of the Reiherstieg, in Wichhorst Shipbuilding yard. | Feet. 400 | Feet. 50 | Feet. 18 | Dry dock. |
| Reiherstieg Co. Wing. | Left bank of Reiherstieg, 100 yards from its mouth. | 262½ | 39½ | 14 | } Double dry dock. |
| Stulcken Co..... | | 144½ | " | " | |
| Slip No. I..... | ? | 310 | 54 | 18 | } Dry dock. 1,150 tons |
| " " II..... | ? | 239½ | | 8½ Ford. 13½ Aft | |
| " " III..... | ? | 160¾ | | 9½ Ford. 19½ Aft | } Patent slips. 1,050 " |
| " " IV..... | ? | 121½ | | 6 Ford. 10½ Aft | |
| " " V..... | ? | 119½ | | 6 Ford. 14½ Aft | |

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PLATE 8.
To face page 52.

Lighting and Power.

The whole of the harbour of Hamburg is lit by electric light, and many of the cranes are worked by electric power.

It is not known where all the power houses are, but there is a large one for electric power near the eastern end of the Kaiser Wilhelm Hafen, another large one of the same description about 300 yards NW. of the Rathaus (see under "Town," page 60), a third in the Karolinen Strasse near the Criminal Law Courts (see under "Town," page 60), and a fourth just to the northward of the center of the Sandthor Hafen.

There is a large hydraulic power house close to the southern end of the Jungfern Brücke, about 260 yards NW. of the head of the Sandthor Hafen. This supplies power to most of the cranes on the north side of the Elbe.

Gas works are numerous in Hamburg and Altona and will be found in the following positions:

- (1) Close to the head of the Grasbrook Hafen.
- (2) Altona, about 1,700 yards NW. of the principal railway station.
- (3) At the center, on the west side of the Guano Fleth.
- (4) On the N. side of the Holz Hafen, about 1½ miles E. of the head of the Baken Hafen.
- (5) About 2¾ miles N. of the head of the Baken Hafen, and several minor ones.

Communications.

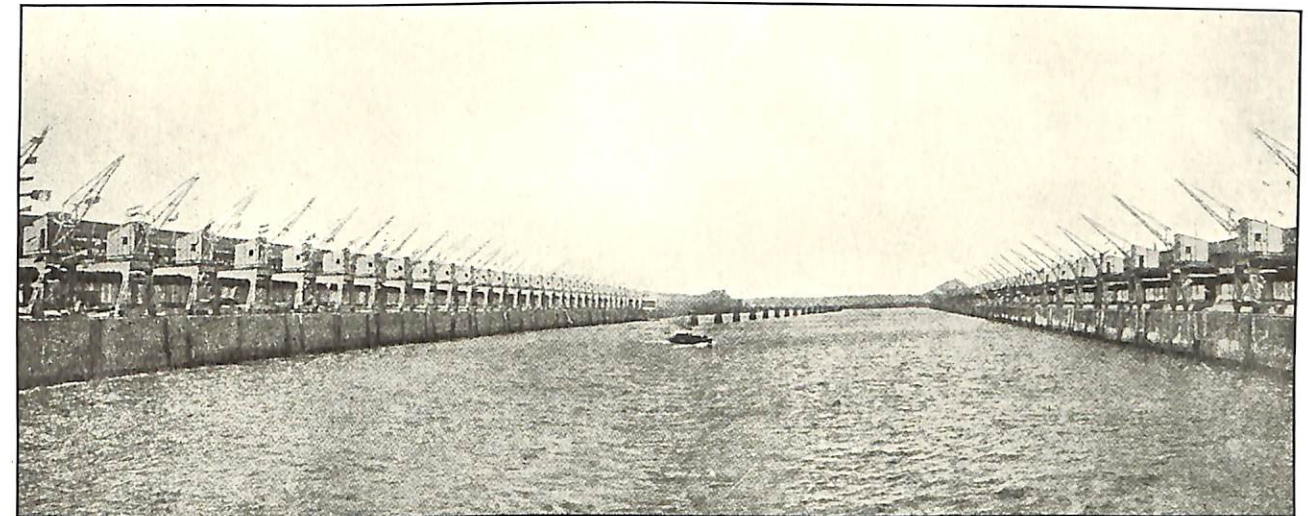
There are numerous steam and motor ferries which ply between the towns and the basins and between the basins.

There are landing places (called Höft) at the outer ends of all the quays of the bigger basins, and it is from these that the ferries run.

There are no less than six railway stations actually on the quays of the basins.

- (1) The Veddel Station, east of the southern end of the Saale Hafen.
- (2) Elbbrücke Station, at the north end of the Elbbrücke (railway bridge), at head of Baken Hafen.

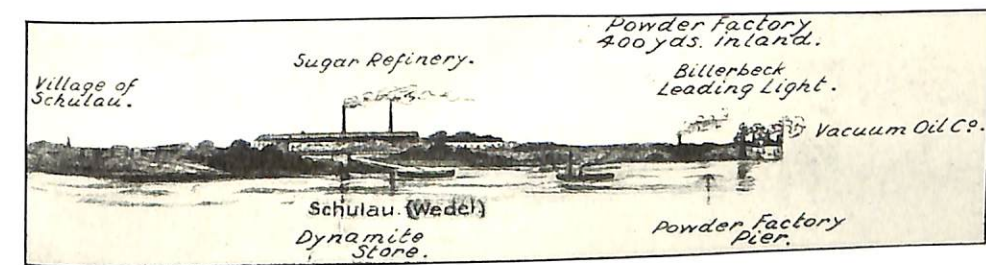
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NEUHOF HARBOUR (HAMBURG).

Kaiser Wilhelm Hafen (see page 51).

The above photograph gives an idea of the number of cranes on the quays of the basins. Those shown in this photograph are electric 3-ton traveling cranes with a radius of 36 feet and a hoisting speed of 2¾ feet per second.



SCHULAU (WEDEL).

Dynamite Store and Powder Factory (see page 48).

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- (3) Hannoversche Station between the *Madgeburger* and the *Baken Hafen*.
 (4) Oberhafen Station, about 600 yards north of (3).
 (5) Hübener Station, near the head of the *Grasbrook Hafen*.
 (6) Ellerholz Station, between the N.E. corner of the *Ellerholz Hafen* and the *Reiherstieg*.

The Waltershof Harbour is to be connected to the Neuhof Harbour by a tunnel carrying a railway under the *Köhlbrand*, but no report of the commencement of this tunnel has been received.

These two harbours were also to be connected by a railway ferry across the *Köhlbrand*, but nothing more has been heard of this project either.

A tunnel under the Elbe has been built from a point about 100 yards west of the mouth of the *Fähr Kanal* in a northerly direction.

It is entered by means of very large lifts, which are capable of taking several loaded carts at a time, the entrances being in the *Schanzenweg* on the south side and just behind the *St. Pauli* landing stage (H.A. Linie) on the north side.

Fuel and Stores.

COAL.

About 14,000 tons of coal are kept in stock by various firms in Hamburg and Altona.

There is presumably a much larger stock of coal actually in Hamburg on any given day, the bulk probably in transit, while the various shipping companies may have their own private stock. This 14,000 tons probably represents the amount actually for sale for the purpose of coaling vessels.

During 1913, 9,500,000 tons of coal were imported. Of this amount 5,790,000 tons were British, the remainder German Westphalian coal.*

The coaling arrangements for ships are said to be inferior to those of most other German commercial ports.

OIL.

There is a large trade in mineral oils in Hamburg.

There are, at present, two basins reserved for this trade, the *Alte Petroleum Hafen* and the *Neue Petroleum Hafen* (see "Basins," page 49).

The *Neue Petroleum Hafen* was completing in July, 1914, and some of the tanks which stood round the old basin were being transferred to its quays and new ones were being erected.

At the old basin the oil was pumped to the tanks and also supplied to ships alongside by means of pipes and hoses.

The storage capacity of the tanks is not known, but as soon as the new basin is ready it is reported that "it will be opened, the storage capacity of the old and new tanks on its quays exceeding by 40 per cent that of the old basin."

STORES.

Stores are obtainable in almost unlimited quantities and of all qualities.

Harbour Craft.

There are an enormous number of small craft, such as dredgers, tugs, lighters, &c., at Hamburg, the number being largely increased by the crowds of river and canal craft which connect Hamburg with the inland districts (see under "Communications—Canals," page 68).

Trade.

The following table shows the imports and exports (amount and value*) for 1912 and 1913:

| By sea. | 1912. | | 1913. | |
|--------------|------------|-------------|------------|-------------|
| | Tons. | £ | Tons. | £ |
| Imports..... | 16,320,160 | 225,760,333 | 16,218,150 | 235,809,000 |
| Exports..... | 7,947,077 | 177,929,640 | 8,741,550 | 193,245,000 |
| Total..... | 24,267,237 | 403,689,973 | 24,959,700 | 429,054,000 |

* These figures include those for Altona and Harburg.

Of which the following came from and went to the United Kingdom:

| By sea. | 1912. | | 1913. | |
|--------------|-----------|------------|-----------|------------|
| | Tons. | £ | Tons. | £ |
| Imports..... | 4,603,672 | 32,592,021 | 4,759,980 | 30,995,734 |
| Exports..... | 1,105,646 | 25,595,296 | 1,538,293 | 29,982,810 |
| Total..... | 5,709,318 | 58,187,317 | 6,298,273 | 60,978,544 |

Shipping.

The following tables show the number and tonnage of the sea-going vessels entered and cleared during 1912 and 1913:

| Sea-going. | 1912. | | | | 1913. | | | |
|--------------|---------|----------------|----------|----------------|---------|----------------|----------|----------------|
| | Steam. | | Sailing. | | Steam. | | Sailing. | |
| | Number. | Gross tonnage. | Number. | Gross tonnage. | Number. | Gross tonnage. | Number. | Gross tonnage. |
| Entered..... | 11,065 | 12,531,220 | 4,709 | 1,036,985 | 11,425 | 13,133,760 | 5,002 | 1,108,134 |
| Cleared..... | 11,341 | 12,665,162 | 6,216 | 1,172,023 | 11,804 | 13,298,542 | 6,181 | 1,198,081 |
| Total..... | 22,406 | 25,196,382 | 10,925 | 2,209,008 | 23,229 | 26,432,302 | 11,183 | 2,306,215 |

Of which the following were British:

| British. | 1912. | | | | 1913. | | | |
|--------------|---------|----------------|----------|----------------|---------|----------------|----------|----------------|
| | Steam. | | Sailing. | | Steam. | | Sailing. | |
| | Number. | Gross tonnage. | Number. | Gross tonnage. | Number. | Gross tonnage. | Number. | Gross tonnage. |
| Entered..... | 3,380 | 4,015,667 | 18 | 22,233 | 3,605 | 4,201,638 | 22 | 23,107 |
| Cleared..... | 3,376 | 4,008,340 | 20 | 22,264 | 3,608 | 4,162,966 | 19 | 24,022 |
| Total..... | 6,756 | 8,024,007 | 38 | 44,497 | 7,213 | 8,364,604 | 41 | 47,129 |

PRIVATE SHIPBUILDING YARDS.

BLOHM AND VOSS.

(See Inset Plan 14.)

This shipyard is situated on the eastern side of the entrance to the *Neuhof Harbour*. It covers an area of about 62 acres and about 11,000 officials and workmen are employed.

Basins.

The firm owns one basin called the *Werft Hafen*. This basin is of irregular shape and measures 675 feet in north and south direction, and 840 feet in an east and west direction. It is about 26 feet deep M.L.W.S., and is tidal.

The northern quay of the *Kuhwerder Hafen* is also used by this firm.

Quayage.

| Basin. | Position. | Length. | Depth at M.L. W.S. alongside. | Remarks. |
|--------------------|--|----------------|-------------------------------|--|
| — | Left (south) bank of Norder Elbe between Neuhof Harbour and Schanzen Graben. | Feet. 1,230 | Feet. 20 to 15 | Line of dolphins 300 feet from quay. |
| Werft Hafen..... | North quay | 825 | 26 | Sloping sides with dolphins (see page 51) and piers. |
| | South quay | 450 | 26 | |
| Kuhwerder Hafen... | North quay | 3,280 | 23 | |

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Lifting Appliances.

| Position. | Number. | Capacity. | Power. | Remarks. |
|---------------------------------|---------|--------------|----------|---|
| On north quay of Kuhwerder..... | 1 | Tons. 246 | Electric | Hammer turret crane with outer lifting jib and small traveling crane on top of jib (moves from end to end), jib horizontal: Load. Hoist. Radius. Tons. 246 Feet. 256 Feet. 130 108 260 200 Traveling crane on jib: 20 300 231 10 302 257 With jib topped: 246 ? 290 113 108 320 174 The centre is about 45 feet from the quay. Load 150 tons, Radius, 84 feet. " 30 " " 105 " |
| North quay of Werft Hafen..... | 1 | 150 | Electric | Sheers. Crane. |
| ?..... | 1 | 100 | Steam | " |
| South quay of Werft Hafen..... | 1 | 50 | Electric | " |
| ?..... | Several | 20 | ? | " |
| ?..... | " | 10 | ? | " |

Slips and Building Capacity.

The firm has nine slips, the positions and dimensions of which are given in the following table:

| Position. | Slip No. | Length. | Width. | Remarks. | |
|----------------------------------|----------------------------|--|-------------------------------------|---|----------------------------|
| Head of Werft Hafen..... | 1 2 3 | Feet. 751½ 885½ 754½ | Feet. 92 102½ 86½ | No. 1 is the southern slip. Gantries 150 feet above slip. For warships, one is screened from public view. | |
| West of the Schanzen Graben..... | 4 5 6 7 8 9 | 459½ 689 564½ 344½ 525 465½ | 75½ 80½ 70½ 59 82 77 | | No. 5 is the western slip. |

The firm has built the following warships:

| Date of launch. | Name of vessel. | Displacement. | Length. |
|-----------------|--|------------------|--------------|
| 1899..... | BATTLESHIP: Kaiser Karl der Grosse..... | Tonns. 11,000 | Feet. 426 |
| 1913..... | BATTLE CRUISERS: Derfflinger..... | 27,560 | 689 |
| 1912..... | Seydlitz..... | 24,190 | 656½ |
| 1911..... | Goeben..... | 22,640 | 610½ |
| 1910..... | Moltke..... | 22,640 | 610½ |
| 1909..... | Von der Tann..... | 19,100 | 562½ |

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| Date of launch. | Name of vessel. | Displacement. | Length. |
|---|---|---------------|---------|
| | | Tons. | Feet. |
| ARMORED CRUISERS: | | | |
| 1906..... | Scharnhorst..... | 11,420 | 471½ |
| 1904..... | Yorck..... | 9,350 | 417½ |
| 1902..... | Friedrich Karl..... | 8,860 | 409½ |
| SMALL CRUISER, &C.: | | | |
| 1907..... | Dresden..... | 3,590 | 387 |
| And the following merchant vessel, &c.: | | | |
| 1914..... | Vaterland..... | 56,000 | 881 |
| 1913..... | Floating dock for Imperial Dockyard, Wilhelmshaven, 40,000 tons lifting capacity. | | |
| 1915..... | Floating dock for Austrian Government, 40,000 tons lifting capacity. | | |

Docks and Repair Capacity.

The firm owns five floating docks:

| Dock No. | Position. | Length. | Breadth. | Depth over blocks. | Lifting capacity. | No. of sections. | Remarks. |
|----------|---------------------------------|---------|----------|--------------------|-------------------|------------------|--|
| | | Feet. | Feet. | Feet. | Tons. | | |
| 1 | In Elbe River north of works... | 325 | 52 | 18 | 3,000 | 3 | |
| 2 | In Elbe River north of works... | 350 | 60½ | 18 | 4,700 | 3 | |
| 3 | In Werft Hafen..... | 560 | 88 | 28 | 17,000 | 1 | |
| 4 | In Elbe River north of works... | 590 | 111 | 28 | 17,500 | 3 | A 194-ft. section of No. 4 (lifting capacity 5,500 tons) sometimes used with No. 3. |
| 5 | In Kuhwerder Hafen..... | 1,058 | 132 | 30 | 56,000 | 7 | Five sections of this dock and the whole of No. 4 were bolted together and used for docking "Imperator" in 1913 before the last two sections of No. 5 were ready. There are two electric 3-ton traveling cranes, one on each side of this dock. Radius, 73 feet. |

This firm undertakes any repairs both to hull and engines, and has carried out the refit of many vessels belonging to the Imperial Navy.

Machine Shops.

The positions of the various shops are shown on Inset Plan 14, but a number of new buildings have been and are being built, the positions and details of which are unknown.

Those shops which were in existence in 1913 were excellently fitted with all the latest machinery and tools, and the whole yard is very well organized and conveniently arranged.

Lighting and Power.

The yard is lit throughout by electricity and most of the cranes and other machinery are worked by electricity.

The *Electric Power House* is near the N. E. corner of the Werft Hafen.

There is also an air compressing plant.

Communications.

Two branches of the Harbour Railway serve the yard, in which there are some 2½ miles of railway tracks.

VULKAN A. G.

(See Plate 9.)

This firm, which owns a large shipbuilding yard at Stettin, has now established one between the *Alte Kohlenschiff Hafen* and the *Ross Hafen* at Hamburg. The yard covers an area of about 57 acres.

Basin.

The firm uses the west side of the *Ross Hafen*, but has no basin of its own.

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Quayage.

The quayage on the above-mentioned basin is 2,085 feet long and is believed to have about 27 feet of water alongside at M.L.W.S. 525 feet of this quayage is taken up by the firm's No. 2 floating dock (see "Docks," page 56).

There is another quay to the northward of the yard, being the east side of the mole separating the *Kohlenschiff Hafen* and the *Ellerholz Hafen*.

This quay is 585 feet long (available), depth of water alongside unknown (? 46 feet). The firm's Nos. 1 and 3 docks usually lie off this quay.

Both quays are served by the railway.

Lifting Appliances.

| Position. | Number. | Capacity. | Power. | Remarks. | | |
|--------------------------|----------|--------------|-------------|---|---------------------|---------------------|
| | | | | Load. | Hoist. | Radius. |
| On Ross Hafen quay..... | 1 | Tons. 246 | Electric. | Turret tripod crane. | | |
| | | | | | | |
| | | | | Tons. 246 98½ | Feet. 180 187 | Feet. 96½ 182 |
| Travelling crane on jib: | | | | | | |
| | | | | 20 | 206 | 189 |
| | | | | 10 | 218 | 200 |
| " " " | 1 | 40 | Electric. | Centre is 39 feet from quay. Hoist? Travelling crane. | | |
| " " " | 1 | 10 | ? Electric. | Radius 75 feet } Hoist 98 feet } Travelling crane. | | |
| " " " | Several. | 3 | ? | Radius 82 feet } Hoist ? } Travelling cranes. | | |
| " " " | 1 | 100 | Steam. | Radius 36 feet } Hoist ? 140 feet. Radius ? 47½ feet. | | |

Slips and Building Capacity.

The firm has four building slips in this yard, the dimensions of which are as follows:

| Position. | Slip No. | Length. | Breadth. | Remarks. |
|---------------------------|----------|---------|----------|--|
| | | Feet. | Feet. | |
| At north end of yard..... | 1 | 1,000 | 114 | No. 1 is the eastern slip. These slips have gantries 160 feet high above the slipways, with numerous 5- and 7½-ton lifters travelling on them. |
| | 2 | 850 | 108 | |
| | 3 | 720 | 110 | |
| | 4 | 680 | 98½ | |

This firm has built the following vessels:

| Date of launch. | Name. | Length. | Tonnage. |
|------------------|------------------------------------|---------|--------------------------|
| | | Feet. | Tons. |
| WARSHIPS: | | | |
| 1913..... | S.M.S. "Grosser Kurfürst"..... | 580 | 26,100 displacement. |
| 1911..... | S.M.S. "Friedrich der Grosse"..... | 564 | 24,300 " |
| MERCHANT VESSEL: | | | |
| 1912..... | "Imperator"..... | 881 | 52,120 gross. |
| FLOATING DOCK: | | | |
| 1912..... | Vulcan No. 3..... | 525 | 25,000 lifting capacity. |

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In 1914 the following were completed:
6 merchant vessels of a total of 47,000 tons gross;
10 sets of main engines for ships } total I.H.P., 30,000;
33 " auxiliary engines for ships }
26 cylindrical boilers;

and several superheater installations.
At the end of the year the following were building:
12 merchant vessels of a total of 105,000 tons gross;
17 sets of main engines } total I.H.P., 60,000;
39 " auxiliary engines }
55 cylindrical boilers;

Docks and Repair Capacity.

The firm now owns four floating docks, the details of which are given in the following table:

| Dock No. | Position. | Length. | Breadth. | Depth on blocks. | Lifting capacity. | Number of sections. |
|----------|---------------------------------------|-----------|----------|------------------|-------------------|---------------------|
| 1 | Off north end of the yard..... | Feet. 434 | Feet. 70 | Feet. 18 | Tons. 6,000 | 1 |
| 2 | In Ross Hafen..... | 510 | 82 | 24 | 11,000 | ..... |
| 3 | Off north end of the yard..... | 525 | 108½ | 33 | 25,000 | 1 |
| 4 | ? At head of Alte Kohlenschiff Hafen. | 605½ | ? 88 | ? | 17,500 | 2 |

No. 4 was completed in April, 1914.
The firm can undertake repairs, but the yard is not specially adapted for this work, except in the provision of docks. The primary intention of these works was the building of large war and merchant vessels, but a certain amount of repair work has been done lately.

Machine Shops.

The positions of the various shops are shown on plate 9.
They are up to date in every respect and are conveniently placed.

Lighting and Power.

The works are lit throughout by electricity, the current for which and for the various electric mechanisms, as also compressed air and pressure water for hydraulic engines, is supplied by the power house near the S.E. corner of the yard.

Communications.

The yard is connected to the Harbour Railways by a branch line and is intersected in all directions by railway tracks.

REIHERSTIEG SCHIFFSWERFTE A.-G.

(See Inset Plan 14.)

This firm has a ship and engine building yard on both sides of the *Reiherstieg* at its confluence with the *Norder Elbe*.

The yard covers an area of about 11¼ acres, of which about two-thirds is on the east side of the *Reiherstieg*.

In the beginning of 1913 the *Brandenburg Yard* was absorbed into this firm.

This yard is on the east side of the mouth of the *Fähr Canal* and covers an area of about 3½ acres.

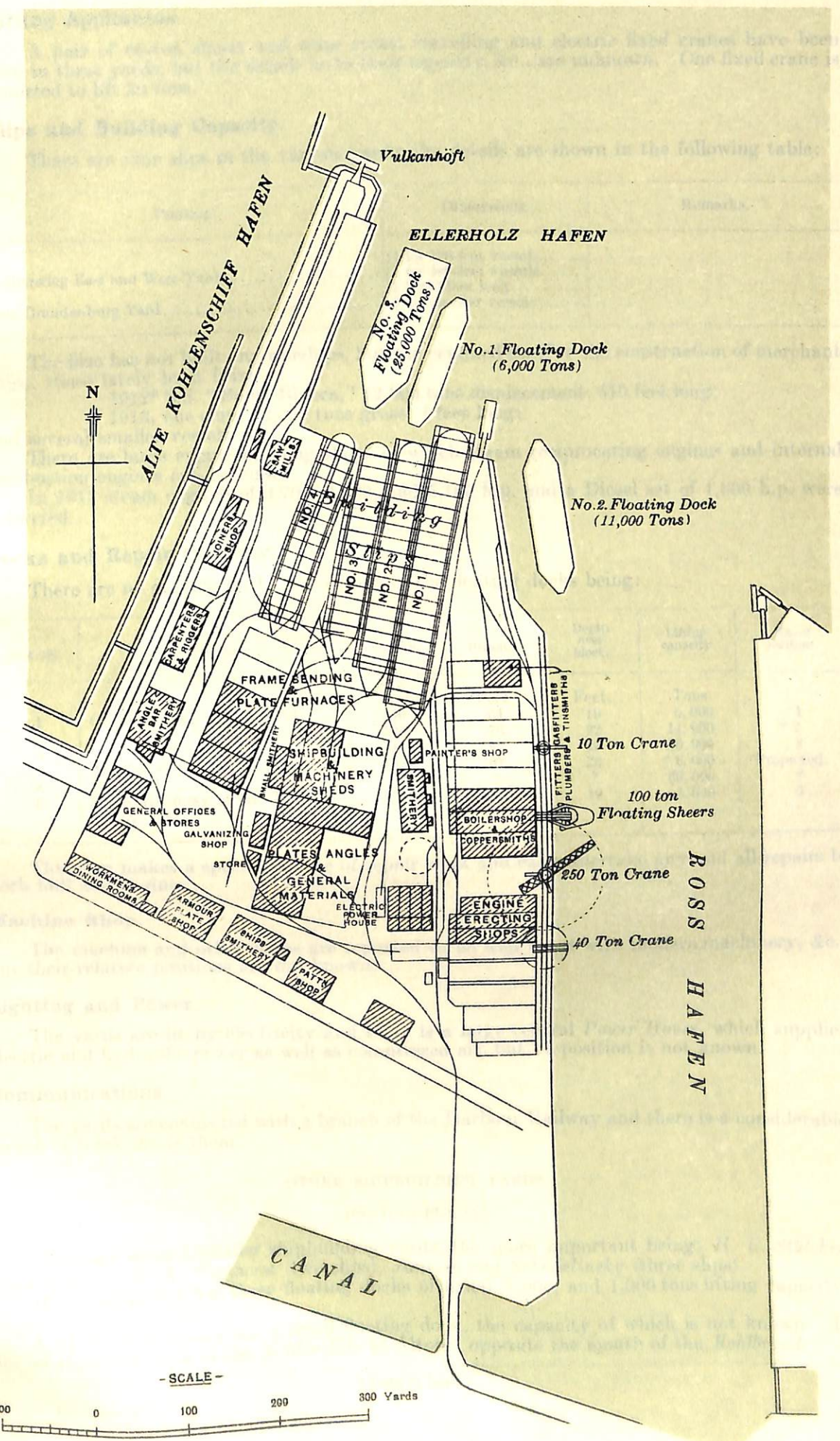
The firm employed an average of about 2,600 men in 1913.

Basins and Quayage.

This firm has no basins, but uses the Elbe and the various "Kanals," as shown below:

| River or kanal. | Length of quayage. | Depth along-side at M.L.W.S. | Remarks. |
|------------------|--------------------|------------------------------|--------------------------|
| Norder Elbe..... | Feet. 123 | ..... | (Late Brandenburg Yard.) |
| | 400 | ..... | Reiherstieg West Yard. |
| Fähr Kanal..... | 360 | ..... | Reiherstieg East Yard. |
| Guano Fleth..... | 285 | ..... | (Late Brandenburg Yard.) |
| Reiherstieg..... | 285 | ..... | Reiherstieg West Yard. |
| | 185 | | " " |
| Werft Kanal..... | 835 | | Reiherstieg East Yard. |
| | 465 | | " " |

VULCAN A.G. SHIPYARD (HAMBURG)



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THE TOWNS.

(See Plan 15.)

Hamburg and its "sister city," Altona, lie on the right bank of the Norder Elbe, about 73 nautical miles from the open sea.

Area and Population.

They cover an area of about 30 square miles and had a total population of 1,126,000 in 1915. Of these, some 950,000 live in Hamburg.

History and Administration.

The city of HAMBURG is a Hansa Town and is said to have been founded in A. D. 811 by Charlemagne.

It was granted a charter as a free city by the Emperor Frederick Barbarossa in 1188, and this was confirmed in 1510, when the city and the surrounding territory were recognised as a separate state.

The Neustadt (New Town) was founded in 1618 by the Dutch and South German Protestants who had been driven from their homes by the religious wars.

In 1811 Hamburg, having fallen into the hands of Napoleon some five years earlier, was incorporated in the French Empire; but in 1814 the French were driven out.

In 1815 the Free State joined the German Confederation, and in 1866, when this broke up, it entered the North German Confederation.

In 1871, at the re-establishment of the German Empire, Hamburg entered the Empire as a self-governing member, under the protection of the King of Prussia.

It is governed in a similar manner to Bremen (see page 31).

ALTONA, which had previously been but a small village, was peopled, in about 1500, by settlers in the same way as the Neustadt of Hamburg.

It stands in the province of Holstein, Prussia, of which it is the largest town.

The western half of the town is called Ottensen.

Buildings and Hospitals.

The Church of St. Catherine stands 450 yards N.N.W. of the head of the Sandthor Hafen in the Altstadt Harbour.

The positions of the principal buildings and the hospitals of the cities are indicated below by bearing to the nearest point and by their approximate distance in yards or statute miles from this church.

West.

Naval Observatory and Meteorological Signal Station, 1 mile; Tunnel lifts, 1½ miles; Seamen's Home, 1 mile; Fish packing buildings, 1½ miles; Altona boundary, 1½ miles; Fish Auction Hall, 1½ miles; House of the G.O.C. of the Hamburg-Altona District, 2½ miles; Town Hall, 2½ miles; a large Museum, 2½ miles; St. Christian's Church, 2½ miles.

W. b. N.

Admiralty Offices, 900 yards; Fire Station, 1,000 yards; Sheep Market, 1,400 yards; Seamen's Hospital, 1½ miles; Altona boundary, 1½ miles; Church, 2 miles; Fire Station, 2½ miles; Large School, 2½ miles; Post Office, 2½ miles; Altona Railway Station, 2½ miles; Church, 3½ miles.

W.N.W.

St. Nicholas' Church, 350 yards; Hop Market, 450 yards; St. Michael's Church, 1,300 yards; Market Square, 1,600 yards; Fire Station, 1½ miles; St. Pauli Concert Hall, 1½ miles; Drill Hall, 1½ miles; Altona boundary, 1½ miles; a Church, 1½ miles; Barracks, 2½ miles; Ottensen North Railway Station, 3 miles; Gas Works, 3½ miles.

N.W. b. W.

Cattle Market, 1½ miles; Altona boundary, 1½ miles; St. Johannis Church, 2½ miles; Military Hospital and Holsten Railway Station, 2½ miles; Kaltenkirche Railway Station (light railway), 2½ miles.

N.W.

Town Hall, 900 yards; Holsten Concert Hall, 1 mile; Civil and Criminal Law Courts, 1½ miles; Sternschanze Railway Station, 1½ miles; Altona boundary, 2½ miles; Apostolic Church, 3½ miles; Altona boundary, 3½ miles.

N.W. b. N.

Bourse, 600 yards; Customs Office, 1 mile; Prison, 1½ miles; Large Hotel, 1½ miles; College, 1½ miles; Christ Church, 2½ miles; Altona boundary, 3½ miles.

N.N.W.

Council House, 600 yards; Theatre, 1,500 yards; Head Post Office, 1 mile; Zoological Gardens, 1½ to 1½ miles; Rothenbaum Barracks, 1½ miles; Markus Church, 3 miles; Altona boundary, 3½ miles.

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N. b. W.

Entertainment Hall, 1,100 yards; Dammtor Railway Station, 1½ miles; Telephone Exchange, 1½ miles; Eppendorf Hospital, 3¼ to 3½ miles; Altona boundary, 3½ miles.

North.

St. Johannis Church, 2 miles; Church, 3½ miles. Airship Sheds (Fuhlsbüttel), 5½ miles.

N. b. E.

St. Peter's Church, 500 yards; Lombard's Bridge, 1,400 yards; Entertainment Hall, 1,550 yards; Lake Ferry Offices, 2½ miles; Powder Magazine, 3½ miles; Large Prison, 5½ miles.

N.N.E.

Fish Market, 300 yards; School, 400 yards; Lake Boathouse, 1,500 yards; Fire Station, 3 miles; Gas Works, 3½ miles.

N.E. b. N.

Art Gallery, 1,350 yards; St. George's Church, 1,700 yards; Large Orphanage, 2½ miles; Church, 3½ miles; Barmbeck Railway Station, 3½ miles; Penal Settlement, 4½ miles.

N.E.

St. Jacobi Church, 700 yards; Fire Station, 1,100 yards; Principal Railway Station, 1,300 yards; Roman Catholic Church, 1½ miles; Municipal General Hospital, 1½ miles; Seminary, 1½ miles; St. Gertrude's Church, 2½ miles; Workhouse, 2½ miles; Church, 3 miles; Lunatic Asylum, 3½ miles; Friedrichsberg Railway Station, 3½ miles.

N.E. b. E.

Natural History Museum, 1,000 yards; Technical School, 1,300 yards; Large Hall, 1,500 yards; Water Tower, 1½ miles; Landwehr Railway Station, and Fire Station, 2½ miles; Church, 2½ miles; Church, 4 miles.

E.N.E.

Railway Station, 1,150 yards; Berliner Tor Railway Station, 1½ miles; Hasselbrook Railway Station, 3½ miles; Barracks, 3½ miles; Wandsbeck Railway Station, 4½ miles.

E. b. N.

Mint, 1,350 yards; Lübeck Railway Station, 1½ miles; Hamm Church, 2½ miles; Race Course, 4 miles.

East.

Disinfecting Establishment, 1½ miles; Church, 2½ miles.

E. b. S.

Goods Station, 1,300 yards; Electric Power House, 1½ miles.

For other Power Houses, see under "Commercial Port," Lighting and Power, page 52.

Open Spaces.

The most central open space is the Hop Market, just on the westward of St. Nicholas Church (see "Buildings and Hospitals," above).

It is an open square and covers an area of 3½ acres.

The walls of the old city of Hamburg have been converted into gardens which form a semicircle round it on the W., N. and E. sides.

These gardens are, on an average, 220 yards wide and the circumference covered by them (inclusive of roads and canals) is about 2½ miles long.

On the N.W. side of these gardens there are two large open spaces, the Heiligengeist Feld and the Zoological Gardens.

The Heiligengeist Feld covers an area of about 54½ acres and the Zoological Gardens, with the surrounding graveyards, about 51½ acres.

Lighting and Power.

The towns of Hamburg and Altona are lit by both gas and electricity.

The positions of the Gas Works and Electric Power Houses are noted under "Commercial Port," Lighting and Power, page 52.

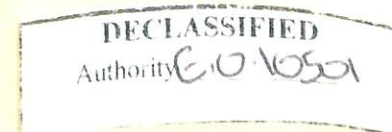
Water.

The Water Works, which have been enlarged recently, are at Rothenburgsort, about 2½ miles up the Norder Elbe.

There is a Water Tower at the western end of these works and another 1½ miles N.E. b. E. of the Church of St. Catharine (see under "Buildings and Hospitals," page 60).

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Internal Communications.

FERRIES.

See under "Commercial Port," page 52.

RAILWAYS.

Hamburg and Altona are connected by rail and there are stations at intervals all along this line.

There is also an underground railway, with numerous stopping places, which surrounds the towns on their W., N. and E. sides.

The Harbour Railway connects the city of Hamburg with all the basins and harbours.

TRAMWAYS.

There are electric tramways which run along nearly all the principal streets of the two cities. They radiate in all directions from the vicinity of the *Council House* (see under "Buildings and Hospitals," page 60).

TUNNEL.

There is a tunnel under the Elbe which connects Hamburg with the Steinwerder Harbour.

It is a double tunnel, the right-hand opening being used for going and the left-hand for coming.

It is reached from the street level by means of lifts, two at each end, each of which is capable of taking three or four small carts or carriages, besides a number of foot passengers.

The roadway in each part of the tunnel is only capable of taking the width of one cart and the footpath is only about 3 feet wide.

For position of the tunnel, see under "Commercial Port"—Communications, page 53.

BRIDGES.

There are two bridges across the *Norder Elbe* at Hamburg, one of which (the western) carries the railway and two footways. The other, which is 250 yards further up the river, is a road-bridge and carries the tramway to *Veddel* and *Wilhelmsburg*. (See Plate 10.)

The railway continues in a southerly direction through *Wilhelmsburg* and across the *Süder Elde* to *Harburg*.

The bridges are both just to the eastward of the heads of the *Baken* and *Moldau Hafens*.

TELEGRAPHS AND TELEPHONES.

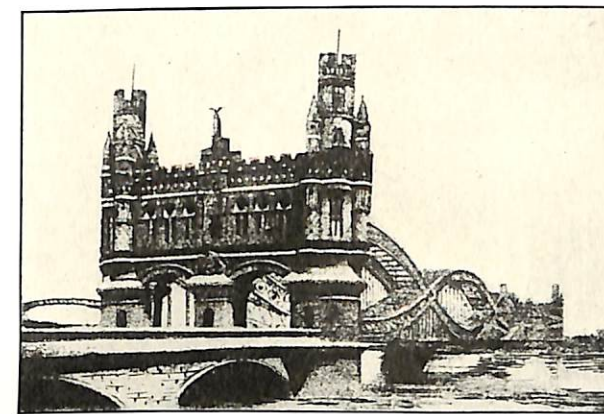
The telegraph offices are to be found at the Post Offices, of which the following is a list (see Plan 15):

| Office No. | Street. | Street No. | |
|------------|--|------------|---|
| Head. | Stephansplatz | | Near Botanical Gardens. |
| 2 | Ring Strasse | 2 | Near Holsten Concert Hall. |
| 3 | Gross Neumarkt | 31 | N. of St. Michael's Church. |
| 4 | Sophien Strasse | 45 | W. of St. Pauli Concert Hall. |
| 5 | Brenner Strasse | 11 | S. of the R. C. Church. |
| 6 | Zollverein Strasse | ? | E. of Water Works. |
| 7 | Klosterthor | 8 | S. of Central Station. |
| 8 | Doye Strasse | ? | N.E. of Meteorological Station. |
| 9 | Vorsetzen | 34 | N. of Nieder Hafen. |
| 10 | Hannover Railway Station | | E. of Megdeburger Hafen. |
| 11 | Alterwall | 57 | W. of the Bourse. |
| 12 | Post Strasse | 13 | N.W. of Council House. |
| 13 | Grindelberg | 1 | N. of Rotherbaum Barracks. |
| 14 | Kehrwieder | E. corner. | N. of centre of Sandthor Hafen. |
| 15 | Wenden Strasse | 6 | In Hammerbrook (east of city). |
| 16 | Bartel Strasse | 120 | W. of Sternschanze Railway Station. |
| 17 | Corner of Mittelweg and Louisen Allée | | S. of St. Johannis Church. |
| 18 | Corner of Stein Strasse and Pierde Markt | | S.W. of St. Jacobi Church. |
| 19 | Von der Tann Strasse | 14 | N.N.W. of Christ Church. |
| 20 | Martini Strasse | 10 | Close to Eppendorf Hospital. |
| 21 | Arndt Strasse | 18 | N.W. of the Orphanage. |
| 22 | Elsa Strasse | 19 | N. b. E. of the Workhouse. |
| 23 | Wandsbeck Chaussée | 127 | N.N.E. of Hohenfelde Railway Station. |
| 24 | Mühlendamm | 61 | E.N.E. of the General Hospital. |
| 25 | Claus Groth Strasse | 60 | N.E. of Bergfelde Railway Station. |
| 26 | Hammerland Strasse | 143 | W. b. S. of Hamm Church. |
| 27 | Vierlander Strasse | 14 | N.E. of the Rothenburgsort Water Works. |
| 28 | Niedernfelder Strasse | 3 | N.E. of Veddel Railway Station. |
| 29 | Norder Elbe Strasse | 85 | S. of Stülcken's Shipyard. |
| 30 | Eppendorfer Weg | 284 | W. b. S. of Eppendorf Church. |

The Telephone Exchange is in the *Schlüter, Strasse* due west of the Rotherbaum Barracks.

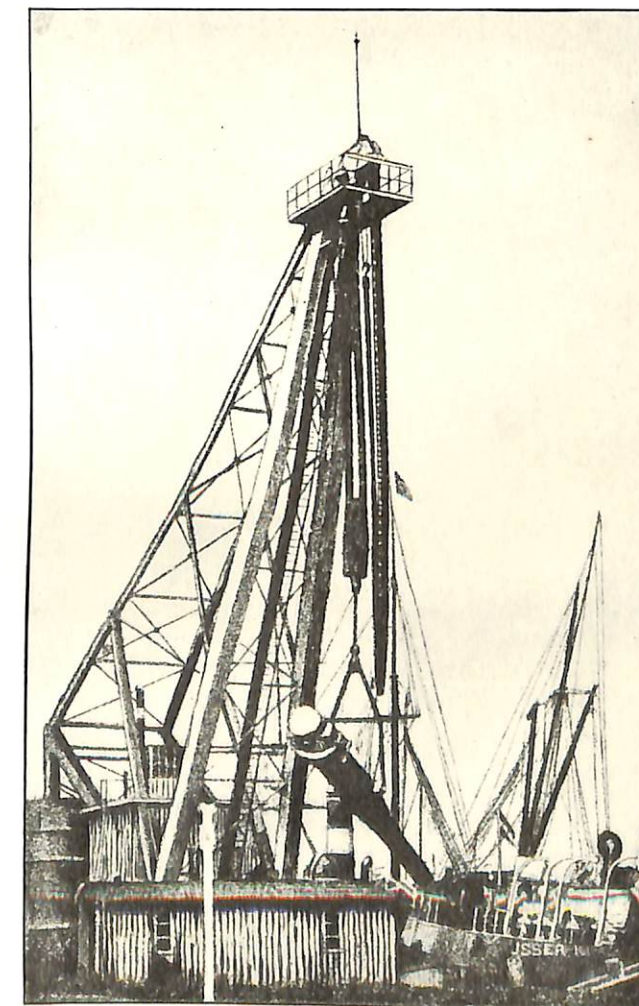
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PLATE 10.
To face page 62.

HAMBURG.



DIE NEUE ELBBRÜCKE.

The road bridge across the Elbe, built in 1888. The railway bridge, which was built in 1873, is 250 yards lower down the river, and is partly visible on the extreme left of the photograph.



150-TON SHEERS.

Taken 1905.

These sheers stand near the extremity of the quay between the *Moldau* and *Segelschiff Hafens*. The platform at the top is 110½ feet above mean river level.

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COMMUNICATIONS.

Steamship Services.

Hamburg, being the principal commercial port on the continent of Europe, has an enormous number of steamship connections with all parts of the world.

It is also the headquarters of the *Hamburg-Amerika Linie* (Hamburg-Amerikanische Packetfahrt Aktien Gesellschaft), which is the largest shipping company in the world.

The following is a list of the principal lines running from Hamburg before the war:

| Company. | Ports of call. | Terminal port. | Remarks. |
|---|---|------------------------|--|
| Hamburg Amerika Linie. | Direct..... | New York..... | Sailings vary according to season. |
| | Boulogne, Southampton..... | " | Every three weeks. |
| | Southampton, Cherbourg..... | " | Every fortnight: (Summer weekly.) |
| | New York..... | Newport News..... | Every three weeks. New York to Newport News by Slo-man Union Line. |
| | Boston (homewards, Baltimore)..... | " | Fortnightly. |
| | Philadelphia..... | " | " |
| | Baltimore..... | " | " |
| | Emden..... | St. John (N. B.)..... | " |
| | "..... | Portland (Maine)..... | Monthly. |
| | "..... | New Orleans..... | 2-3 times a month |
| | St. Thomas, Trinidad, Carupano, La Guayra, Puerto Cabello. | Curaçao..... | Monthly. |
| | Antwerp, St. Thomas, Pto. Colombia, Cartagena, Colon, Port Limon, Pto. Barrios. | Livingston..... | " |
| | Antwerp, St. Thomas, Kingston, Pto. Colombia, Cartagena, Colon, Bocas del Toro, Port Limon, Pto. Barrios. | " | " |
| | Grimsby, St. Thomas, San Juan, P. R., Porto Rico, Sanchez, Samana, Puerto Plata, Monte Christo, Cap Hayti. | Port-au-Prince..... | " |
| | Curaçao..... | Colon..... | " |
| | Antwerp, Bilbao, Gijon, Vigo, Havana, Puerto Mexico, Tampico, Vera Cruz; (Homeward), Tampico, Pto. Mexico, Vera Cruz, Havana, Antwerp, Rotterdam. | Mexico..... | " |
| | Antwerp, Bilbao, Gijon, Vigo, Cadiz, Malaga, Havana, Progreso, Puerto Mexico, Vera Cruz, Tampico; (Homeward) Puerto Mexico, Vera Cruz, Havana, Antwerp, Rotterdam. | " | " |
| | Håvre, Southampton, Santander, Corunna, Vigo, Havana, Vera Cruz, Tampico; (Homeward) Puerto Mexico, Vera Cruz, Havana, Vigo, Santander, Plymouth, Havre. | Tampico..... | " |
| | Håvre, Southampton, Santander, Corunna, Havana, Vera Cruz, Tampico; (Homeward), Puerto Mexico, Vera Cruz, Havana, Corrunna, Santander, Plymouth, Håvre. | " | " |
| | Antwerp, St. Thomas, Havana, Matanzas, Manzanillo. | Guantanamo..... | " |
| | Antwerp, Bilbao, Malaga, Cadiz, St. Thomas, Havana, Matanzas, Cardenas, Sagua la Grande, Caibarien, Cienfuegos. | Santiago (Cuba)..... | " |
| | Bremen, Emden, Rotterdam, Antwerp, Penang, Singapore, Manila, Hong Kong, Shanghai, Tsingtau, Tientsin, (Taku), Dalny, Yokohama, and Kobe. | Kobe..... | " |
| | Through freights to Deli, Bankok, Batavia, Samarang, Soerabaya, alternatively to Tsingtau and the ports of China, Korea, the Philippines, Sunda Is., &c., <i>vid.</i> | Far Eastern ports..... | " |
| | 1. Bremerhaven—Rotterdam..... | | Fortnightly. |
| | 2. Direct..... | | Monthly. |
| 3. Antwerp..... | | Fortnightly. | |
| 4. Direct..... | | " | |
| 5. Antwerp..... | | Three times a month | |
| The Far Eastern Service has been extended to Vancouver, Portland, Seattle, and San Francisco. | | | |

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| Company. | Ports of call. | Terminal port. | Remarks. |
|---|--|------------------------|----------------------|
| Hamburg Amerika Linie—cont. | Bremen, Rotterdam, Antwerp, Colombo, Madras, direct or with through freights to Chittagong, the ports of the Red Sea, India, and Ceylon. | Calcutta..... | Fortnightly. |
| | Bremen, Rotterdam, Antwerp, Bombay..... | Karachi..... | " |
| | Bremen, Antwerp, Bassein, Moulmein..... | Akyab..... | Every three weeks. |
| | Antwerp, Vigo, Leixoes, Lisbon, Madeira, Paras. | Manaos..... | Monthly. |
| | Håvre, Vigo, Leixoes, Lisbon, Madeira, Paras. | " | " |
| | Leixoes, Lisbon, Rio de Janeiro..... | Santos..... | Three times a month. |
| | Boulogne, Leixoes, Lisbon, Madeira, Rio de Janeiro. | " | Monthly. |
| | Antwerp, Leixoes, Lisbon, Maranhao, Parahyba (Tutoya). | Ceara..... | " |
| | Antwerp, Håvre, Leixoes, Lisbon, Parahyba do Norte, Pernambuco, Maceio, Bahia. | Aracaju..... | " |
| | Antwerp, Leixoes, Lisbon, Pernambuco, Bahia. | Victoria (Brazil)..... | " |
| | Leixoes, Lisbon, Paranagua, Desterro..... | Rio Grande do Sul..... | " |
| | Leixoes, Paranagua, Sao Francisco do Sul..... | " | " |
| | Pernambuco, Bahia, Victoria, Rio de Janeiro. | Santos..... | " |
| | Leixoes, Lisbon, Rio de Janeiro, Santos..... | Rio Grande do Sul..... | " |
| | Håvre, Leixoes, Lisbon..... | Aracaju..... | " |
| | Boulogne, Southampton, Vigo, Lisbon, Tenerife, Rio de Janeiro, Montevideo. | Buenos Aires..... | " |
| | Boulogne, Southampton, Corunna, Lisbon, Rio de Janeiro, Montevideo. | " | " |
| | Montevideo..... | " | Three times a month. |
| | Antwerp..... | Rosario..... | Monthly. |
| | Montevideo, Buenos Aires..... | " | " |
| | Emden, Antwerp, Montevideo, Buenos Aires. | " | " |
| | Antwerp..... | Bahia Blanca..... | Fortnightly. |
| | Emden..... | " | Monthly. |
| In conjunction with Woermann Line and the Hamburg-Bremen-Afrika Line. | Rotterdam, Teneriffe, Las Palmas, Dakar, Rufisque, Bathurst, Monrovia, Manoh, Sulimah, Cape Mount, Marshall, Grand Bassa, River Cess, Sinoe, Sasstown, Cape Palmas, Drewin, Lahou, Sassandra, Half Jack, Grand Bassam. | Assinie..... | Fortnightly. |
| (Deutsch Ost Afrika Linie.) | Antwerp, Las Palmas, Monrovia, Banana, Boma, Matadi, Noqui, Sao Antonio. | Lüderitz Bucht..... | " |
| | Las Palmas, Monrovia, Grand Bassa, Grand Bassam, Swakopmund, Walfisch Bay. | " | " |
| | Dover, Boulogne, Madeira, Las Palmas, Conakry, Sierra Leone, Monrovia, Grand Bassa, Sekondi, Accra, Lome, Lagos, Victoria, Duala, Kribi, Plantation, Longji. | " | " |
| | Antwerp, Las Palmas, Monrovia, Axim, Chama, Elmina, Cape Coast Castle, Saltpond, Anamaboe, Appam, Winnebah, Landana, Cabinda, Loanda, Benguela, Mossamedes, Swakopmund. | " | " |
| | Rotterdam, Las Palmas, Cape Palmas, Accra, Addah, Lagos, Forcados, Burutu, Warri, Benin, Koko. | Sapelli..... | " |
| | Bremerhaven, Rotterdam, Teneriffe, Las Palmas, Conakry, Cape Palmas, Sekondi, Quitta, Lome, Danoe, Grand Popo, Whydah. | Kotonou..... | " |
| | Antwerp, Madeira, Teneriffe, Las Palmas, Dakar, Rufisque, Bissao, Bolamo, Conakry, Monrovia, Grand Bassam. | " | " |
| | Rotterdam, Las Palmas, Sierra Leone, Cape Palmas, Accra, Addah, Quitta, Lome, Danoe, Grand Popo, Whydah. | " | " |
| Hamburg Amerika Linie Deutsch Ost Afrika Linie | Las Palmas, Monrovia, Great Bassa, Cape Palmas, Lome, Lagos, Fernando Po (Santa Isabel), Manoka, Malimba, Lonji, Plantation, Kribi, Great Batanga, Campo Puno, Bata, Benito, Eloby, Mokunga, Kriegsschiffshaven, Isongo, Debuncha, Bibundi, Sango. | Rio del Rey (Kamerun). | " |

| Company. | Ports of call. | Terminal port. | Remarks. |
|---|---|------------------------|--|
| Hamburg Amerika Linie. | Dover, Boulogne, Madeira, Las Palmas, Conakry, Sierra Leone, Monrovia, Grand Bassam, Sekondi, Accra, Lome, Lagos, Victoria, Duala, Kribi, Plantation. | Lonji..... | Monthly. |
| (Deutsch Ost Afrika Linie)—Cont. | Rotterdam, Las Palmas, Cape Palmas, Lagos, Calabar, Oron, Opobo, Bonny, Okrika, Bakana, Buguma, Abonema. | Degama..... | " |
| Hamburg Amerika Linie. | Antwerp, Port Sudan, Djibuti, Muskat, Bunder Abbas, Lingah, Bahrein, Bushire, Mohammera, Ahwaz, Bazra. | Bagdad..... | " |
| In conjunction with Kosmos Line. | Canary Is., Montevideo, Punta Arenas, Corral, Coronel, Talcahuano, Valparaiso, Coquimbo, Taltal, Antofagasta, Iquique, Arica, Mollendo. | Callao..... | Occasional sailings from London and Antwerp. |
| Hamburg Danzig Linie. | Direct..... | Danzig..... | Every few days. |
| | | Libau..... | " |
| Hamburg Südamerikanische Dampfschiffahrts Gesellschaft. | Boulogne, Southampton, Corunna, Vigo, Lisbon, Teneriffe (occasionally), Rio de Janeiro, Montevideo; (homewards) Montevideo, Rio de Janeiro, Bahia, Lisbon, Vigo, Southampton, Boulogne. | Buenos Aires..... | Three or four times a month. |
| | Antwerp (outwards), Håvre, Vigo, Leixoes, Lisbon, Madeira, Para. | Manaos..... | Fortnightly. |
| | Boulogne, Leixoes, Lisbon, Madeira (occasionally), Pernambuco, Bahia, Rio de Janeiro; (homewards) Rio de Janeiro, Bahia, Madeira (occasionally), Lisbon, Bahia, Madeira (occasionally), Leixoes, Boulogne (if number of passengers warrants), Rotterdam (occasionally). | Santos..... | Weekly. Boulogne, Pernambuco, and Bahia, are called at only if there is a sufficient number of passengers. |
| | Håvre and Leixoes, or Leixoes and Lisbon alternately, Cabedello, Maceio, Paranagua, Sao Francisco, Desterro. | Rio Grande do Sul..... | Fortnightly. |
| | Antwerp, Spain, Montevideo, Buenos Aires..... | Bahia Blanca..... | Three or four times a month. |
| Woermann Line..... | Dover, Boulogne, Madeira, Las Palmas, Conakry, Freetown (Sierra Leone), Monrovia, Grand Bassam, Sekondi, Accra, Lome, Lagos, Victoria, Duala, Kribi, Plantation; (homewards) Duala, Victoria, Plantation; Accra, Sekondi, Gr. Bassam, Monrovia, Freetown (Sierra Leone), Conakry, Las Palmas, Teneriffe, Madeira, Southampton, Boulogne. | Lonji (Kamerun)..... | Fortnightly. Called at Bathurst on homeward trip occasionally. |
| | Rotterdam, Teneriffe, Las Palmas, Dakar, Rufisque, Bathurst, Monrovia, Marshall, Manoh, Cape Mount, Gr. Bassa, River Cess, Sinoe, Sasstown, Cape Palmas, Sassandra, Lahou. If necessary Sullimah, Blieron, Taboa, Bereby, Nanakroo Drewin, Half Jack, and Gr. Bassam; (homewards) Half Jack, Sasstown, Sinoe, Gr. Bassa, Cape Palmas, Sasstown, Sinoe, Gr. Bassa, Cape Mount, Manoh, Sulimah, Monrovia, Sierra Leone, Sherbro, Sierra Leone, Bathurst (occasionally), Dakar, Las Palmas, Teneriffe. | Assinie..... | Monthly. |
| | Antwerp..... | Lüderitz Bucht..... | " |
| | Antwerp, Las Palmas, Monrovia, Sao Antonia, Banana, Boma (Futa Massabi, Binda, Mussuco, occasionally), Noqui; (homewards) Landana (Loango, Mayumba, Nyanga, Sette Cama, occasionally), Como, Munda, Elobey, Coco Beach, Muni River, Adje, Handje, N'dote, Benito, Bata, Lagos, Cape Palmas, Monrovia, Las Palmas. | Matadi..... | " |
| | Rotterdam, Las Palmas, Conakry, Sierra Leone, Sherbro, Grand Bassa, Cape Palmas, Gr. Bassam, Assinie, Axim, Sekondi, Chama, C. C. Castle, Saltpond, Appam, Winnebah (Dixcove, Adjuah, Anambo, Mumford, Half Jack, occasionally); (homewards) Winnebah, Appam, Saltpond, C. C. Castle, Sekondi, Axim, Gr. Bassa, Sierra Leone, Sherbro, Sierra Leone, Conakry, Las Palmas. | Accra..... | " |

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| Company. | Ports of call. | Terminal port. | Remarks. |
|--|---|------------------------|------------------|
| Woermann Linie— Cont. | Rotterdam, Las Palmas, Cape Palmas, Accra, Addah, Lagos, Forcados, Burutu, Warri, Koko; (homewards) Lagos, Winebah, Appam, Saltpond, C. C. Castle, Sekondi, Cape Palmas, Las Palmas. | Sapelli..... | Monthly. |
| | Antwerp, Las Palmas, Monrovia, Landana, Cabinda, Loanda, Benguela, Mossamedes, Swakopmund (Ambriz, Mussara, Ambrizette, Kinsembo, Muculla, Cuio, Lobito Bay, occasionally); (homewards) Swakopmund, Mossamedes, Cape Lopez, Gaboon, Monrovia, Sierra Leone, Las Palmas, Antwerp (occasionally). | Lüderitz Bucht..... | " |
| | Las Palmas, Monrovia, Swakopmund; (homewards) Swakopmund, Cape Lopez, Gaboon, Lagos, Lome, Addah, Accra, Sekondi, Monrovia, Las Palmas, Teneriffe, Madeira. | " | " |
| | Nordenham, Rotterdam, Teneriffe, Las Palmas, Cape Palmas, Sekondi, Quitta, Lome, Danoe, Grand Popo, Whydah; (homewards) Avrekété, Whydah, Grand Popo, Danoe, Quitta, Addah, Prampram, Lome, Cape Palmas, Las Palmas | Kotonou..... | " |
| | Antwerp, Madeira, Teneriffe, Las Palmas, Dakar, Rufisque, Bissão, Bolana, Conakry, Monrovia, Gr. Bassa; (homewards) Calabar, Lagos, Lome, Monrovia, Sierra Leone, Las Palmas. | " | " |
| | Rotterdam, Las Palmas, Sierra Leone, Cape Palmas, Accra, Addah, Quitta, Lome, Danoe, Grand Popo, Wydah; (homewards) Wydah, Grand Popo, Quitta, Lome, Addah, Accra, Sekondi, Cape Palmas, Sierra Leone, Conakry, Bolama Bissao, Teneriffe, Las Palmas. | " | " |
| | Las Palmas, Monrovia, Gr. Bassa, Cape Palmas, Lome, Lagos, Fernando Po, Victoria, Manoka, Kribi, Plantation, Lonji, Campo, Bata, Benito, Elobey, Gaboon, Malimba, Duala, Kriegsschiffhaven, Mokedange, Isongo, Debuncha, Bibundi, Sanje; (homewards) Lagos, Lome, Cape Palmas, Gr. Bassa, Monrovia, Las Palmas, Teneriffe, Madeira. | Rio del Rey (Kamerun). | " |
| | Rotterdam, Las Palmas, Cape Palmas, Forcados, Calabar, Opobo, Ekwanga, Bonny, Okrika, Bakana, Buguma, Abonema; (homewards) Calabar, Accra, Cape Palmas, Sierra Leone, Sherbro, Sierra Leone, Dakar, Las Palmas. | Degama..... | " |
| In conjunction with the Deutsch Ost Afrika Linie and the Hamburg Amerika Linie | Bremerhaven, Antwerp, Southampton, Las Palmas, Teneriffe, Swakopmund. | Lüderitz Bucht..... | Fortnightly. |
| Ernst Russ Line | Hangö..... | Abo..... | Weekly. |
| " | Helsingfors..... | Viborg..... | " |
| Rickmers Line | Dalny, Vladivostock..... | Nikolaevsk..... | Every 2—3 weeks. |
| Robert Sloman, Junr. | Malaga, Barcelona, Genoa, Livorno, Naples, Catania, Messina. | Palermo..... | ? |
| Sloman Union Line Pt. II, sec. 3. | New York..... | Newport News..... | Monthly. |

| Company. | Ports of call. | Terminal port. | Remarks. |
|--|--|-----------------------------------|--|
| Deutsch Ost Afrika Linie. | Rotterdam and Antwerp, alternately outwards, Southampton, Lisbon, Tangier, Marseilles, Naples, Port Said, Suez, Aden, Mogadisciu, Killindini, Tanga, Dar-es-Salaam, Zanzibar, Mozambique, Chinde, Beira, Lourenço Marques, Durban, East London, Port Elizabeth, Cape Town, Lüderitz Bay, Swakopmund, Las Palmas, Teneriffe, Southampton, Antwerp, Bremerhaven. | Round Africa..... Hamburg..... | Fortnightly. |
| | Bremerhaven, Antwerp, Southampton, Las Palmas, Teneriffe, Swakopmund, Lüderitz Bay, Cape Town, Port Elizabeth, East London, Durban, Lourenço Marques, Beira, Chinde, Mozambique, Zanzibar, Dar-es-Salaam, Zanzibar, Tanga, Killindini, Mogadisciu, Aden, Suez, Port Said, Naples, Marseilles, Tangier, Lisbon, Southampton, Flushing. | "..... | Fortnightly. Calling on the homeward voyage at Mogadisciu and Lisbon only once monthly. |
| | Antwerp, Lüderitz Bay, Durban, Lourenço Marques, Inhambane, Beira, Killindini, Tanga, Zanzibar, Dar-es-Salaam (Nossi-Bé, Analalava, Majunga, or vice versa), Morondava, Tulear, Ambohibe, Fort Dauphin, Zanzibar, Dar-es-Salaam, Tanga, Killindini, Port Said, Marseilles, Antwerp. | "..... | Monthly. |
| | Antwerp or Rotterdam, Port Said, Killindini, Tanga, Zanzibar, Dar-es-Salaam, Morondava, Tulear, Ambohibe, Fort Dauphin, Durban, Antwerp. | "..... | " |
| Flensburger Dampfer Co. | Southampton, South Africa..... Antwerp..... | Mexican ports..... | ? |
| Hansa Line, in conjunction with the Hamburg Amerika Linie. | Colombo, Madras, Calcutta, and direct or with through freights to Chittagong, the ports of the Red Sea, India, and Ceylon, via Bremen, Rotterdam, Antwerp. Occasionally via Middlesborough. | Far Eastern ports..... | Fortnightly. |
| | Bombay, Karachi, and direct or with through freights to Mormugoa, the ports of the Red Sea, the Persian Gulf, and India, via Bremen, Rotterdam, Antwerp. | " "..... | " |
| | Rangoon, and with through freights to Bassein, Moulmein, Akyab, via Bremen, Antwerp. | " "..... | Every three weeks. |
| | Calicut, Cochin..... | " "..... | Monthly. |
| A. Kirsten Line..... | Direct..... | Rotterdam..... | Twice weekly. |
| | "..... | Petrograd..... | Weekly. |
| | " when navigation at Petrograd is closed. | Reval..... | |
| | Direct..... | London..... | Daily. |
| Gerhard and Hey Line, in conjunction with Oscar Ott Line. | Direct..... | Petrograd..... | Every five days. |
| | "..... | Reval..... | " eight " |
| Oscar Ott Line, in conjunction with Gerhard and Hey Line. | Direct..... | Petrograd..... | " 5 " |
| | "..... | Reval..... | " 8 " |
| | When navigation to Petrograd is closed, the service to Reval is fortnightly. | | |
| Hamburg - Portugal Line. | Oporto..... | Lisbon..... | Weekly. |
| | Antwerp, Gibraltar, Tangier, Larache, Rabat. | Casablanca..... | Three times monthly. |
| | Antwerp, Gibraltar, Tangier, Ceuta, Tetuan. | Melilla..... | Monthly. |
| Behnke and Sieg Line. | Danzig..... | Libau..... | ? |
| | Direct..... | Danzig..... | ? |
| Horn Line..... | Genoa, Leghorn, Naples, Catania, Messina, Antwerp..... | Palermo..... | Every three weeks. |
| | | Brazilian ports..... | ? |

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| Company. | Ports of call. | Terminal port. | Remarks. |
|---|--|---|---|
| Kosmos Line..... | Canary Islands, Monte Video, Punta Arenas, Corral, Coronel, Talcahuano, Valparaiso, Coquimbo, Taltal, Antofagasta, Iquique, Arica, Mollendo (homewards), Mollendo, Arica, Antofagasta, Valparaiso, Punta Arenas, Monte Video, Las Palmas, Cherbourg, Leith or Antwerp..... | Callao..... Honolulu..... | Fortnightly. At 2 or 3 months' interval. |
| Deutsch-Australische Dampfschiffs Gesellschaft. | Rotterdam, Antwerp, Cape Town, Algoa Bay, Melbourne, Sydney, Antwerp, Lisbon, Cape Town, Mossel Bay, Algoa Bay, Adelaide, Melbourne, Sydney, Rotterdam, Antwerp, Cape Town, East London, Fremantle, Port Adelaide, Sydney, Antwerp, Lisbon, Cape Town, East London, Fremantle, Port Adelaide, Sydney, Antwerp, Suez Canal, Sabang, Padang, Batavia, Cheribon, Samarang, Soerabaya. | Brisbane..... Newcastle..... Townsville..... Makassar..... | Every four weeks. " " " " " six " |

Railways and Roads.

The railways and roads, which radiate in all directions from Hamburg, are described under "Hadeln Land—Communications," pages 43 and 44, and "Holstein—Communications," section 5.

The local railway lines are described under "Town—Communications," page 62.

Canals.

The Elbe River, above Hamburg, is described on pages 45-49, and several canals have been constructed connecting this river with various others and with some of the ports of the Baltic.

ELBE—TRAVE CANAL.

This canal, which leaves the Elbe at *Lauenburg*, 31 statute miles above Hamburg, runs in a north and south direction, and connects this river with the Trave River, on which stands the city of *Lübeck*.

Lauenburg may be reached by vessels drawing 9 feet at mean river level and the details of the canal are shown in the following table:

| Total length. | Depth at M.W.L. | Width at bottom. | Locks. | | | Number of bridges. | Bridges. | | Remarks. |
|------------------|-----------------|---|---------|-----------------|----------------------------|--------------------|-----------------------------|-----------|--|
| | | | Number. | Minimum Length. | Minimum Width of entrance. | | Minimum Head room at M.W.L. | | |
| Stat. miles. 41½ | Feet. 10½ | Feet. 46 wider at turning places and curves | 3 | Feet. 262½ | Feet. 20½ | 3 | Feet. 39½ | Feet. 13½ | Going north, two raising locks and five lowering locks. The summit level is 39 feet above mean sea level. The greatest rise, 13½ feet, is at the first lock. |

This canal was built by the Hansa town, Lübeck.

ELBE AND STOR CANALS.

The Elbe Canal which consists partly of a canal and partly of the canalized Elbe River, connects the Elbe with the town of *Schleswig* by branch, the Stör Canal, and also to the Havel River, and thus to *Spandau* and *Berlin*.

Only that part of the Elbe Canal between the Elbe and the junction with the Stör Canal, and the Stör Canal itself will be described here, and these will be treated as one canal.

This canal leaves the Elbe at *Husum*, 10 statute miles above Hamburg, and makes a wide curve to the north, crossing the *Stör* River, and then the *Stör* Canal, and finally the *Havel* River.

The following table gives the principal dimensions of the canal:

| Total length. | Depth at M.W.L. | Width at bottom. | Locks. | | | Bridges. | | | Remarks. | |
|------------------|-----------------|------------------|---------|-----------------|----------------------------|---------------------------------|---------|---------------------------|---|--|
| | | | Number. | Minimum Length. | Minimum Width at entrance. | Minimum Depth on sill at M.W.L. | Number. | Minimum Width of opening. | | Minimum Head room at M.W.L. |
| Stat. miles. 51½ | Feet. 4½ | Feet. ? 23 | 14 | Feet. 140 | Feet. 17½ | Feet. 4½ | 33 | Feet. 17 | Feet. Swing bridges 7 Fixed bridges 11½ | The northern 4 miles of the canal are in the bed of the Schwerin Lake. It is possible for vessels drawing 5½ feet to reach Kleinen at the northern end of the lake 7½ miles beyond Schwerin. |

This canal is not navigable in winter on account of it being frozen.

In 1912 a proposal was put forward to canalize the *Wallenstein Graben*, a small stream which connects the Schwerin Lake with the Baltic at *Wismar*. It is not known whether this proposal has been seriously considered, but no work had been done in July, 1914.

PLAUER CANAL.

This canal leaves the Elbe at *Bittkau*, 153¾ statute miles above Hamburg. It connects the river with the town of *Brandenburg* and thence, by natural waterways, to *Potsdam* and on by canal to *Berlin*.

Vessels drawing 8½ feet can reach Bittkau from Hamburg at the mean height of the river and 4½ feet at low river.

The dimensions of the canal are:

| Total length. | Depth at M.W.L. | Width at bottom. | Locks. | | | Bridges. | | | Remarks. | |
|-----------------|-----------------|------------------|---------|-----------------|----------------------------|---------------------------------|---------|---------------------------|----------|--|
| | | | Number. | Minimum Length. | Minimum Width at entrance. | Minimum Depth on sill at M.W.L. | Number. | Minimum Width of opening. | | Minimum Head room at M.W.L. |
| Stat. miles. 29 | Feet. 6 | Feet. ? 36 | 3 | Feet. 233 | Feet. 28½ | Feet. 6 | 10 | Feet. 28½ | Feet. 13 | The last 6¼ miles before reaching Brandenburg are in the bed of the Plauer Lake and River Havel. |

This canal is usually not navigable from the middle of December till the end of February on account of ice.

MITTELLAND CANAL.

A canal is projected from *Magdeburg*, 179 statute miles above Hamburg, to *Hannover*, thus connecting the *Elbe* with the *Weser* and the *Dortmund—Ems Canal* (see Section 1).

The work on this canal had not been commenced in July, 1914, and there is considerable opposition to the project.

OTHER WATERWAYS.

Besides the above canals, there are many minor ones and navigable tributaries.

Wireless Telegraphy.

There is no commercial wireless station at Hamburg or Altona, but at the airship station at *Fuhlsbüttel* (northern suburb of Hamburg) there is a small station used in connection with the airships.

It is believed that a low power installation has been established for military purposes in the *Rotherbaum* district of Hamburg (see plan 15) probably at or near the barracks.

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