18-in. 25-ton guns, and the’“ Cyclops,” “ Gorgon,” “ Hecate ” and “ Hydra,” each of 3560 tons and provided with two turrets carrying two 10-in. 18-ton guns. They were protected with armour from 8 to 12 in. thick, and their speed was from 10 to 12 knots.

The “ Devastation,” commenced, in 1869, represented Reed's views of what a sea-going turret ship should be. Low sides were adopted, but not in combination with rigging and sails. She was the first sea-going battleship in the British navy which depended wholly on steam power for propulsion. She was 285 ft. long, 62 ft. 3 in. broad, 27 ft. mean draught and 9330 tons displacement. Her sides, which, except right forward, rose only to a height of 4 ft. 6 in. above water, were protected with armour 12 in. thick. Her armament con­sisted of four 35-ton guns, mounted in pairs in two turrets, one at each end of a raised breastwork or redoubt which extended about 150 ft. along the middle of the upper deck. The guns were thus elevated to the height of some 14 ft. above the surface of the water. The turrets were protected by armour 12 in. and 14 in. thick, and the breastwork or redoubt by armour 10 in. and 12 in. thick. A forecastle extended forward from the fore-end of the breastwork at a height of 9 ft. 3 in. above the water-line; but in wake of this fore­castle the side armour dropped to a height of only 4 in. above the surface of the water, at which level there was an armoured deck. She was provided with twin-screw

machinery of 7000 I.H.P., which gave

her a speed of 14∙2 knots, and she

carried a large coal supply. After the

loss of the “ Captain," a special committee, including many of the highest

professional and scientific authorities in

the United Kingdom, was appointed to

examine into the design of such vessels.

Of the “ Devastation ” they reported

that " ships of this class have stability

amçly sufficient to make them safe

against the rolling and heaving action

of the sea they agreed, however, in

recommending a plan which the constructors of the Admiralty had proposed, with the view of increasing her

range of stability and the accommodation of the crew. This consisted in the

addition of side superstructures, formed

by continuing up the ship’s side with

light framing and plating as high as

the level of the top of the breastwork,

and carrying the breastwork deck over

to the sides. The structures were continued aft on each side some distance

beyond the breastwork, providing two

spacious wings, which added largely to

the cabin accommodation. A good idea

of her general appearance may be ob­tained from fig. 49 (Plate XII.). The

“ Devastation” was followed by the

“ Thunderer ” of the same dimensions,

and the “ Dreadnought ” of 10,820

tons displacement, 8000 I.H.P. and 14

knots speed; a vessel of higher free-

board, plated with 14 in. of armour

and carrying four 38-ton guns; she

was the most powerful and best protected vessel of her day.

Sir Edward Reed retired from the Admiralty a short time before the “ Captain ” foundered at sea. During bis seven years’ term of office some forty iron armour- clads of various sizes and types, besides iron cruisers and numer- ous other vessels, had been added to the British navy, the adoption of armour for the protection of the vital parts of ships had become established, and especially had the importance of utilizing armour in such a manner as to exclude projectiles from the region of the water-line become recognized. The change from the widely- distributed armament of the first broadside armour-clads to the highly concentrated armament of the turrets, and from the high freeboard ship with sail-power to the low freeboard turret ship without sails, had also been effected; so that when Sir Edward Reed retired in 1870, the latest type of battleship was entirely different from that which existed when he took office; and although the construction of broadside ironclads had not been discontinued, “ the wooden walls ” had practically ceased to exist. Sir Edward Reed was succeeded by a Council of Construction composed of his immediate assistants, with Mr Barnaby (afterwards Sir Nathaniel Barnaby) as its president; but three years later this council was dissolved,

and Sir N. Barnaby was placed at the head of the Construction Department.

The sea-going qualities of the “ Devastation ” had successfully demonstrated that the battleship of the future might depend wholly on steam propulsion; and although many naval officers and others continued to hold the view that sea-going ironclads must of necessity be rigged ships, in the designs which immediately followed sail power was omitted. In the “ Inflexible ” (fig. 50, Plate XII.), and the sister ships “ Ajax ” and “ Agamemnon,” the offensive power was concentrated mainly in two pairs of heavy guns, as it was in the “ Devastation ” and other turret ships which preceded them; but in them the armour defence also was concentrated over a comparatively small space amidships, the unprotected ends being formed into what was called raft bodies by belts of cork, within which was placed a portion of the ship’s coal, &c. Thus the buoyancy was secured by a citadel amidships which could not be penetrated, and by ends which might be

riddled but (it was contended) not be destroyed. The arrangement shown in fig. 51 represents the “ Ajax ” and “ Agamem- non.” The “ Inflexible ” was similar but larger. Sir N. Barnaby described the design of the “ Inflexible ” in 1874 before the Institution of Naval Architects thus:

“ Imagine a floating castle 110 ft. long and 75 ft. wide, rising 10 ft. out of the water, and having above that again two round turrets planted diagonally at its opposite corners. Imagine this castle and its turrets to be heavily plated with armour, and that each turret has within it two guns of about 80 tons each—perhaps in the course of a few years guns of twice 80 tons each. Conceive these guns to be capable of firing, all four together, at an enemy ahead or on either beam, and in pairs towards every point of the compass.

“ Attached to this rectangular armoured castle, but completely submerged, every part being 6 ft. to 7 ft. under water, there is a hull of the ordinary form, with a powerful ram bow, with twin screws and a submerged rudder and helm. This compound structure is the fighting part of the ship. Seaworthiness, speed and. shapeliness would be wanting in such a structure if it had no additions to it; there is therefore an unarmoured structure lying above the sub­merged ship and connected with it, both before and abaft the armoured castle; and as this structure rises 20 ft. out of the water,