|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table XVI. *(Continued).—Development of some of the Leading Features of Notable Armoured Battleships from 1860 to 1910.* | | | | | | | | | | | | | | | |
| **Vessel.** | **Date of Launch.** | **Hull.** | | | | | **Speed.** | **1.H.P.** | **Propulsive Machinery.** | | | **Armament (including Machine Guns).** | **Heavy**  **Guns— where mounted.** | **Thickest Armour.** | **Cost (excluding Guos).** |
| **Material.** | **Length.** | **Breadth.** | **Mean Draught.** | **Load Displace­ment.** | **No. of Screws.** | **Engines.** | **Boilers.** |
| **Erzherzog Franz Ferdinand (Austrian)** | iqc8 | **Steel.** | **\* Ft. 45o\* 9'** | **Ft. Iα.**  **80 6** | **Ft. In.**  **26 6** | **Tons.**  **I4∣220** | **Knots**  **20∙5** | **20,000** | **2** | **2 sets 4-cyliπdcr vertical triple ex­pansion** | **Yarrow** | **4—I2,, 8—9'4\*,**  ***20*—3∙9', 6∙12 pr. and *2* machι□e guns**  **3 torpedo tubes** | **Barbettes** | **Inches**  **10** | **£** |
| **Minas Geraes (Brazilian)** | **1908** | **»** | **5∞** | **83 0** | **25 0** | **ig,28l** | **21'4** | **27,212** | **2** | **Vertical triple ex­pansion** | **Babcock and Wil­cox** | **12—12', *22—*4∙7',**  **and 8—3 pr. guns** |  | **12** | **ι,821r400** |
| **Delaware . (United States)** | **1909** |  | **SW** | **85 3** | **27 0** | **20, OOO** | **21$** | **28,57S** | ***2*** | **vertical triple ex­pansion** | **Babcock and Wil- cox** | **10—12\*, 14—5\*,**  **aαd 10 smaller, light and machine guns**  ***2* torpedo tubes** |  | **II** |  |
| **Danton . (French)**  **1.** | **1909** | **,\*** | **476** | **84 0** | **27 0** | **l8,O28** | **i9,35** | ***22,*500** | **4** | **Parsons turbines** |  | **4^1i\* <12^Tι4', and *26* smaller, light and machine guns**  ***2* torpedo tubes** |  | ***12*** | ***2* 068,000** |
| **K\*wachi. .**  **(Japanese)** | **Bdg. in**  **1910** |  | S2O | **84 0** | **27 0** | **30,8θθ** | **20\*0** | **26,500** | **4** | **Curt⅛ turbines** | **Míyabara small tube** | **12—12r, 10—6r,**  **aαd 12—4· 7'guns**  **5 torpedo lubes** | **’■** | **12** |  |
| **Alfonso**  **XIII. (Spanish)** |  |  | **435** | **78 *9*** | **25 6** | **I5Λ6θ** | **Iζ)∙5** | **1S>3∞** | **4** | **Parsons turbines** | **Yarrow** | **8—12\*t so—4',**  **2—3 pr∙. 2 light, and *2* machine guns**  **3 torpedo tubes** |  | **IO** |  |
| **Moreno (Argentine)** |  |  | **578** | **95 *9*** | **27 6** | **28,000** | **21** | **39.5∞** |  | **Curtis turbines** | **Babcock and W1I- cox** | **12—12\*, 12—6',**  **16—4\*, and 10 smaller guns 2—21' torp. tubes** |  | **12** | **2,200,000** |

7½-in. guns all well protected, while the next step was to vessels of a type very similar to the “ King Edward VII.” class, but of greater gun-power and higher speed, with somewhat thinner armour and smaller coal capacity. These vessels, “ Erzherzog Franz Ferdinand," “ Radetsky ” and “ Zrinigi,” were being completed in 1910. Their arrangements of guns and armour are shown in fig. 78. Battle- ships of far greater fighting value were in 1910 laid down by Austria; of 20,000 tons displacement, 25,000 H.P., and 22 knots speed, mounting ten 12-in. guns, protected by 11-in. armour, and costing about 2¼ millions sterling each.

*Brazil.—*For several years by mutual arrangement no battleships were added to the South American navies, but in 1906 Brazil ordered three vessels of 19,281 tons, 1380 tons heavier than the “ Dread­nought,” which was not then finished; the first two of these carry twelve 12-in. guns in place of the ten of the “ Dreadnought,” and can fire ten guns on either broadside, eight ahead and eight astern; they also carry fourteen 4∙7-in. guns behind 9-1n. armour on the main deck, and eight behind thinner armour on the upper deck. The ship’s side, barbettes and gun mountings are pro­tected by 9-in. armour, the belt armour tapering to 4-in. forward and aft. The vessels are 500 ft. long, 83 ft. beam and 25 ft. draught ; engines of 23,500 I.H.P. being provided for 21 knots. The leading vessel, the “ Minas Geraes" (fig. 79, Plate XVIII.), was built at Elswick; she obtained about 21½ knots on trial, and passed through all her severe gun trials with great success. Fig. 80 shows the general arrangements of guns and armour. The second vessel, the “ Sao Paulo,” was built at Barrow, and was also completed to the same design. The third vessel, the “ Rio de Janeiro,” which in 1910 was being built by the Elswick firm, has been redesigned to be 655 ft. in length over all, 92 ft. beam and 32,000 tons displacement on a draught of 26 ft. Her armament was to be twelve 14-in. guns, with a secondary armament of fourteen 6-in. guns, an anti-torpedo armament of fourteen 4-1n. guns, as well as a number of smaller guns, and three submerged torpedo tubes. She was fitted with four screws and turbines of 45,000 H.P. to drive her at 22½ knots. Her cost was reported to be almost £3,000,000, and in 1910 she was by far the largest vessel on the stocks.

*Argentine Republic.—*Early in 1910 the Argentine Republic ordered two vessels, the “ Moreno ” and “ Rivadavia,” of 28,000 tons, armed with twelve 12-in. guns, twelve 6-in. and sixteen 4-1n. guns, to be built by the New York Shipbuilding Co. and the Fore River Shipbuilding Co. respectively. Their displacement is much greater than that of the largest battleships building at the time they were ordered, although they are 4000 tons smaller than the “ Rio de Janeiro.” They are 578 ft. long, 96 ft. beam, 27⅛ ft. draught, and turbines of 40,000 H.P. are provided for a speed of 22½ knots. The armament is arranged somewhat as in “ Minas Geraes,” but with the midship barbettes arranged so that the guns can fire on either broadside, giving a fire of twelve guns on either broadside, eight ahead and eight astern. The ship’s side and the heavy guns are protected by 12-in. armour, and the 6-in. guns by 6-in. armour; 1600 tons of coal are carried on the load draught out of a possible 4000 tons, and there is also a large stowage for oil fuel.

*Spain.—*For some years battleship building was suspended in Spain, but, after considerable negotiation with British firms, designs were approved for three vessels of 15,130 tons and 19½ knots, to carry eight 12-in. and twenty 4-in. guns, with 10-in. armour on the barbettes, 9 in. on side tapering to 3 in. at bow and 4 in. at stern, and fore and aft internal bulkheads 1⅜ in. thick tor protection against torpedoes. These vessels were named “ Espana,” laid down in 1909, “ Alfonso XIII.” and “ Jaime I.,” in 1910.

*Smaller Battleships.—*At various times several of the naval powers have laid down smaller battleships than those already referred to, such as the British “ Conqueror ” and “ Hero,” of 6200 tons, launched in 1882 and 1888 respectively ; the armoured Coast Defence ships of France, of which the “ Admiral Trehouart,” launched in 1893, of 6534 tons, 17 knots, carrying two 12-in. and eight 3·9-in. guns with good armour protection, is a good example; the monitors of the United States named “ Little Rock,” &c., launched in 1900, of 3235 tons and 12 knots, carrying two 12-in. and four 4-in. guns; and the principal battleships of the lesser European powers. A good example of the last is the Norwegian armour-clad “ Norge ” (fig. 81, Plate XV.). This vessel and her sister the “ Eidsvold," with their predecessors “ Harald Haarfagre ” and “ Tordenskjold,” were built at Elswick for the royal Norwegian navy, and completed in 1900. They had a displacement of 3850 tons, length 290 ft., beam 50 ft. 6 in., draught 16 ft. 6 in., and with twin-screw engines of 4500 horse-power attained 16½ knots speed. They were heavily armed with two 8-in. B.L. guns in armoured gun-houses, one at each end of the vessel; six 6-in. Q.F. guns, four mounted in 5-in. nickel steel casemates, and two in the open, with strong shields; eight 12-pdrs. and six 3-pdrs.; and two submerged torpedo tubes. The water-line was protected with 6-in. Krupp armour over a length of 170 ft., and bulkheads of the same thickness were provided at each end of the belt. These ships form a class of vessels of small size which would prove formidable opponents to many larger armoured ships, and are especially useful for coast-defence purposes.

Table XVI. shows the development of the leading features of notable armoured battleships from the time of the “ Warrior.”

*Cruisers.—*The cruiser type was primarily intended to co- operate with armour-clad fleets, in the same manner as sailing frigates did with fleets of sailing line-of-battle ships, and the earliest cruisers were modelled directly upon the frigates which preceded them, the differences between the two being those incidental to the use of steam power and to the substitution of iron for wood as the building material. As steam propulsion grew in favour engines of greater power were provided, and the rig and sail-spread were reduced till at the present day they