thickness, in combination with a system of coal-stowage in bunkers along the water-line. She carried two 8-in. and ten 6-in. B.L. guns and four torpedo tubes. Her horse-power was 6000 (forced draught) and speed 17∙3 knots, and she carried 750 tons of coal at normal draught, with capacity for 900 tons. The "Astraea,” begun in 1890, may be taken as representing the second-class cruisers of that date. She is built of steel, sheathed and coppered, is 320 ft. long, 49 ft. 6 in. beam, 21 ft. 6 in. mean draught and 4360 tons displacement, and carries two 6-in. Q.F. guns and eight 4∙7-in. Q.F. guns, all on the upper deck and protected by shields, together with four torpedo tubes. She is protected by a steel deck 1 in. to 2 in. thick, and the engine cylinders, which project through this deck, are shielded by 5-in. sloping coamings. The coal bunkers in the neighbourhood of the water-line are minutely subdivided, and the stowage is arranged so as to make full use of the coal protection. Her engines develop 9000 H.P. (under forced draught) and her speed is 19∙5 knots. Her coal stowage is 1000 tons.

The “ Hermes ” (fig. 85, Plate XX.) is one of the largest second- class cruisers added to the Royal Navy. She is 350 ft. long, 54 ft. beam, 20 ft. 6 in. mean draught and 5600 tons displacement. She presents a striking contrast compared with the “ Inconstant,” built in 1866, of almost the same displacement. The “ Inconstant ” was fully rigged, and sailed almost as fast as she steamed; while the “ Hermes ” has no sail, and steams 20 knots, or 6 knots faster than did the older vessel. The “ Inconstant ” was entirely un­protected, and carried her guns on the broadside, with very limited arcs of training; whilst the “ Hermes ” has all-round fire, the fire ahead and astern is a very large percentage of that on the broadside, and her guns all train through large arcs (120° and above) and are well protected by enveloping shields, and the ship herself is protected by a steel deck 1½ to 3 in. thick, besides having coal protection. The “ Inconstant’s ” main armament consisted of ten 9-1n. and six 7-in. M.L. guns; the “ Hermes’,” of eleven 6-in. Q.F. guns, each firing probably ten rounds to one of the “ Inconstant’s ” 9-in., and with a perforation of wrought iron of about one-third as much again. The “ Hermes ” is built of steel, sheathed with wood and coppered. She carries also eight 12-pdrs. and six 3-pdrs., and two submerged torpedo tubes. She has Belleville boilers, developing 10,000 H.P. and giving her a speed of 20 knots.

Somewhat similar to the “ Hermes in. external appearance, the four vessels of the “ Arrogant ” class (fig. 86, Plate XX.) possess certain features of special interest which distinguish them from all other second-class cruisers, in which class they are usually included. They are of 150 tons greater displacement than the “Hermes,” are 30 ft. shorter, but have 3 ft. 6 in. more beam and 6 in. more draught. They are built of steel and are unsheathed, have Belleville boilers, and engines giving 10,000 H.P. and a speed of 19 knots. They have an armament of four 6-in. Q.F. guns, three of which fire right ahead and one right astern; six 4∙7-in. Q.F. guns, three on each broadside; eight 12-pdrs.; nine smaller guns; and two submerged torpedo tubes. All the guns are mounted on the upper deck in shields. The protective deck varies from 1½ in. to 3 in. in thickness. The bow is protected by a belt of 2-in. nickel steel extending to about 40 ft. back from the ram, the top of this belt being level with the main deck, and the bottom edge sloping downwards to strengthen the ram, and a cofferdam formed by two water-tight transverse bulkheads about 3 ft. apart, and extending from keel to main deck, separates the bow from the rest of the vessel. The “Arrogants ” are fitted with tandem rudders, and the deadwood at the after end of the ship is cut away.

The “ Gladiator,” which was sunk in the Solent in 1908 after collision with the “ St Paul,” was one of the “ Arrogant ” class. The Canadian cruiser “ Rainbow,” one of the “ Apollo ” class, very similar to but smaller than the “ Astraea ” class, is of 3400 tons, 9000 LH.P., 20 knots, and carries two 6-in. Q.F., six 4∙7-in. Q.F., eight 6-pdrs., and four torpedo tubes.

The protected cruisers of greater displacement, or first-class cruisers, as they were called, may be divided into four well-marked classes: “ Blake ” and “ Blenheim ” class, “ Edgar ” class (fig. 87, Plate XIX.), “ Powerful ” and “ Terrible ” class (fig. 88, Plate XIX.) and the “ Diadem ” class. The “ Blake ” and “ Blenheim,” begun in 1888, were amongst the earliest cruisers designed by Sir William White at the Admiralty; they are of 9000 tons displacement, 375 ft. long, 65 ft. beam and 27 ft. draught. They carry two 9∙2-in. B.L. guns, one firing directly ahead and the other directly astern, protected by open shields 6 in. thick; ten 6-in. Q.F. guns, of which four are on the main deck, protected by casemates of 6-in. compound armour, and six on the upper deck in shields; sixteen 3-pdrs.; two submerged and two above­water torpedo tubes. Their protection consists of a complete armour deck of steel 3 in. to 6 in. thick, with a dome or coaming over the tops of the cylinders 4 in. to 8 in. thick. Their machinery consists of four independent sets of vertical triple-expansion engines, two on each shaft, for which steam is provided from six double-ended cylindrical boilers giving 20,000, H.P. under forced draught, and a speed of 21 knots; with open stokeholds their power is 13,000 H.P., which gives them a speed of 19¼ knots. They carry 1500 tons of coal. The “ Edgar ” class, begun in 1889, are vessels of 7350 tons displacement, 360 ft. long, 60 ft. beam and 23 ft. 9 in. mean draught. Their armaments consist of two 9∙2-in. B.L. guns and ten 6-in. Q.F., disposed and protected in the same way as the corresponding guns of the “ Blake,” with twenty-four smaller and machine guns, two submerged and two above-water torpedo tubes. The protective deck has a maximum thickness of 5 in., and the cylinders are protected by a raised coaming on this deck, with sloping sides 6 in. thick. They have six double-ended cylin­drical boilers and two sets of vertical triple-expansion engines, developing with forced draught 12,000 LH.P. and giving a speed of 20 knots. They carry 850 tons of coal at normal draught, with storage for 1250 tons. Nine vessels of this class have been built, four of them being sheathed with wood and coppered, the remaining five, including the “ Edgar,” being unsheathed. The “ Powerful ” and her sister the “ Terrible ” are the largest protected cruisers which have been built. They were begun in 1894. They are of steel, sheathed with wood and coppered, are of 14,200 tons dis­placement, 500 ft. length, 71 ft. beam and 27 ft. mean draught, armed with bow and stern 9∙2-in. B.L. chasers, and twelve 6-in. Q.F. guns, of which eight are in 6-in. Harveyized casemates on the main deck and four in similar casemates on the upper deck. They have also eighteen 12-pdr. Q.F. guns, twelve 3-pdrs., nine machine guns and four submerged torpedo tubes. The 9∙2-in. guns are protected by a shallow ring of 6-in. Harveyized steel, surmounted by a 6-in. shield enveloping the gun and crew. The ship herself is protected by a complete deck at the water-line level of Harveyized steel plates 3 in. to 6 in. in thickness, and by a double line of coal bunkers above it. The machinery arrangements constitute the striking feature of these ships. They have no less than forty-eight Belleville boilers in eight boiler-rooms, with two sets of triple-expansion 4-cylinder engines, developing 25,000 H.P. with open stokeholds and giving the ships a speed of 22 knots. They carry as a normal supply 1500 tons of coal, and their bunkers will hold 3000 tons. Four 6-inch guns were added on the upper deck of these ships in 1902.

The “ Diadem ” class, launched in 1897 and 1898, were the last first-class protected cruisers added to the British navy. There are eight vessels of this class, but in the four last-built vessels, of which the “ Spartiate ” was one, some changes were made. The first vessel of the “ Diadem ” class was begun in 1895, is of 11,000 tons displacement, 435 ft. length, 69 ft. beam, 25 ft. 3 in. mean draught, and is built of steel, sheathed and coppered. Her principal armament consists entirely of 6-in. Q.F. guns, of which there are sixteen, twelve being protected by 5-1n. casemates of Harveyized steel, and the others disposed, two on the forecastle as bow chasers, and two on the quarter-deck as stern chasers, all in separate shields. She also carries thirteen 12-pdrs., eleven smaller guns, including machine guns, and two submerged torpedo tubes. The protection consists of a steel deck, whose slopes are 4 in. thick and horizontal portions 2½ in. thick, upon which is stowed the 1000 tons of coal which the vessel ordinarily carries, the full coal capacity being 2000 tons. She is provided with 30 water-tube boilers of the Belleville type, and her machinery develops 16,500 H.P., giving her a speed of 20∙5 knots. The Canadian cruiser “ Niobe ” is one of the first four; in the last four ships the casemates are 6 in. thick and the machinery is of greater power, viz. 18,000 LH.P., giving a speed of a quarter of a knot higher.

Third-class protected cruisers included vessels varying in displacement from 1500 to 3000 tons. With a reduction of displacement come reduction of initial cost and cost of upkeep, a smaller crew, a shorter time for building, and the many advantages attendant upon reduced size and draught of water. It has been found possible to embody in a ship of about 2000 tons displacement many of the most important requirements of a modem cruiser, and a large number of vessels of this class have been added to the fleet. Among these may be mentioned the “ Barham,” a typical small cruiser, which was built in 1889 of steel, of 1830 tons displacement; she is 280 ft. long between perpendiculars, 35 ft. broad and of 12 ft. 8 in. draught of water. As originally completed, this vessel had cylindrical boilers and a ILP. of 4700, giving a speed of 19 knots. In 1898 she and her sister, the “ Bellona,” were reboilered with water-tube boilers of the Thornycroft type, and with these a H.P. of 6000 is obtained, and the vessel reaches a speed of nearly 20 knots. The protection afforded is in the usual form of a protective deck, 1 in. thick on the flat, and sloping sharply downwards near the water- line, where the thickness is increased to 2 in.; and above this deck the coal stowage is arranged in subdivided bunkers. She carries an armament of six 4∙7-in. Q.F. guns in shields on the upper deck, four 3-ρdrs., two machine guns and two above-water torpedo tubes. She carries 140 tons of coal in her normal condition, end her bunkers will take 250 tons. She has a light fore-and-aft rig. The “ Barham ” was followed by several vessels of the “Tauranga” class, built for service in Australian waters, and the “Pearl” class for service in other waters, all of 2575 tons displacement, 19 knots speed and carrying eight 4∙7-in. and eight 3-pdr. Q.F. guns. In 1896-1898 nine smaller and faster cruisers were laid down, known as the “ Pioneer ” class, which might be taken to include the “ Pelorus ” class, the differences between them being small. Of the two classes eleven vessels have been built. The “ Pioneer ” is 305 ft. long, 36 ft. 9 in. broad, 13 ft. 6 in. mean draught and of 2200 tons displacement. She has water-tube boilers of the small-tube type,