

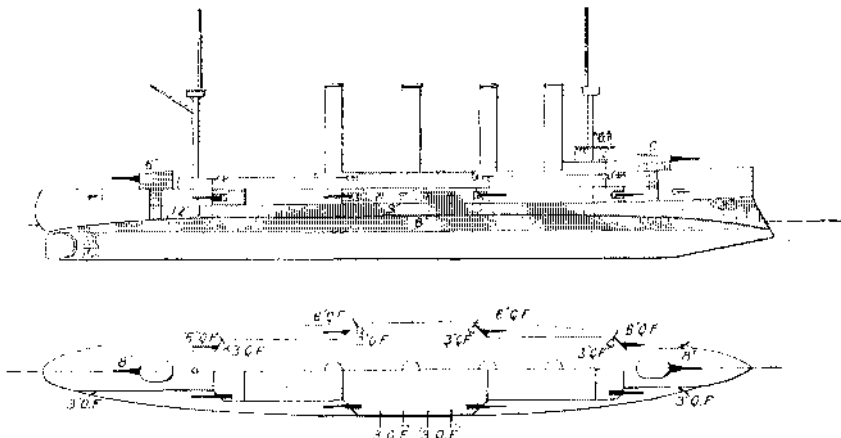
THE RUSSIAN NAVY.

It is difficult to calculate at any given time the exact fighting strength of the Russian navy, and this for the reason that access to her dockyards is forbidden, and considerable efforts are made to preserve secrecy as to the exact condition of the ships that are under construction.

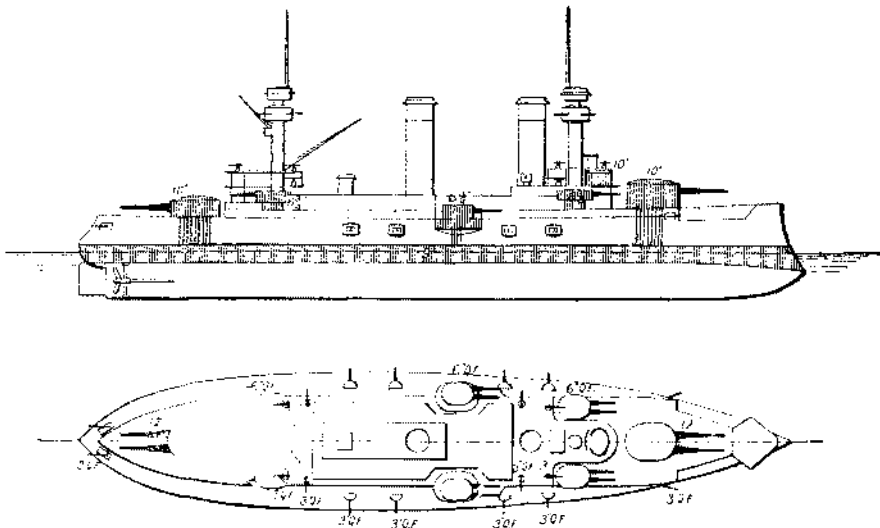
Speaking first of battleships, we find that the latest addition authorized by the government is a class of half a dozen new ships, of which the following are the leading particulars: Displacement, about 16,000 tons; speed, 18 knots; armor, a continuous belt, tapering from 11 inches amidships to 6 inches at the ends; a 4-inch protective deck; 6-inch side armor above the belt; with a second armored deck 2 inches thick forming the gun-deck; and 11 inches of armor on the main turrets. The armament consists of four 12-inch guns in two turrets, twelve 8-inch guns in six turrets, and twenty 3-inch guns, with two submerged and three above-water torpedo tubes. These dimensions, however, are tentative, and may have been considerably modified. It is probable that but little has been done upon these ships as yet. Next we have the "Borodino" class of six ships, of which one, and possibly two, are completed, and the others well advanced.

These are fine vessels of 13,566 tons displacement and a designed speed of 18 knots. They measure 397 feet by 76 feet by 26 feet draft, and are characterized by a lofty spar-deck, whose elevation above the water-line must be fully 30 feet, extending from the bow to the quarter-deck. Forward on this deck is mounted a pair of 12.4-inch, 40-caliber guns, in a turret protected by 11 inches of Krupp armor. Aft on the quarter-deck, and at about 8 feet less elevation, is another pair of 12.4-inch guns protected by a turret armed also with 11 inches of Krupp steel. The inter-

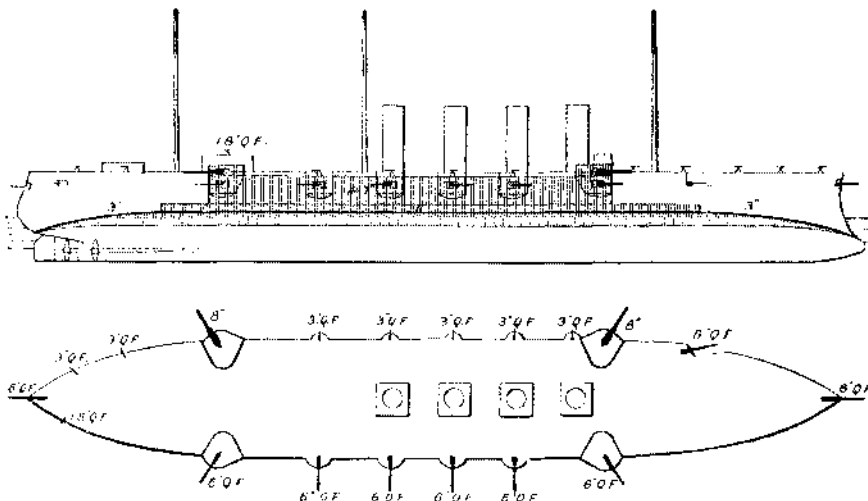
mediate battery of 6-inch 45-caliber guns is disposed as follows: Eight of them are mounted in four turrets protected by 6-inch armor and located two forward of the superstructure, flanking the forward 12.4-inch guns, and a little abaft of the same, and two in turrets aft flanking the after 12.4-inch guns. These four turrets have the same command of probably 36 feet as the forward 12.4-inch guns. Amidships on either beam is a pair of 6-inch guns mounted in turrets protected by 6 inches of armor. The twenty 3-inch guns are mounted four in the bow, four in the stern, and six on either broadside. These vessels carry two submerged broadside torpedo tubes and two above-water, one in the bow and the other in the stern. An interesting feature of these vessels is that an endeavor is made to localize the effect of a blow from the torpedo. This is done by running two vertical longitudinal bulkheads of 4-inch armor throughout the whole length of the ship at a distance of 9 or 10 feet inboard from the ship's sides. The protection to the vitals is particularly complete, consisting of a belt tapering from 9 inches to 4 inches, a protective deck 4 inches thick on the slopes, and a second protected deck 2 inches in thickness at the level of the gun-deck. A similar ship to the "Borodino" class is the "Czarevitch," built at La Seyne, France, in



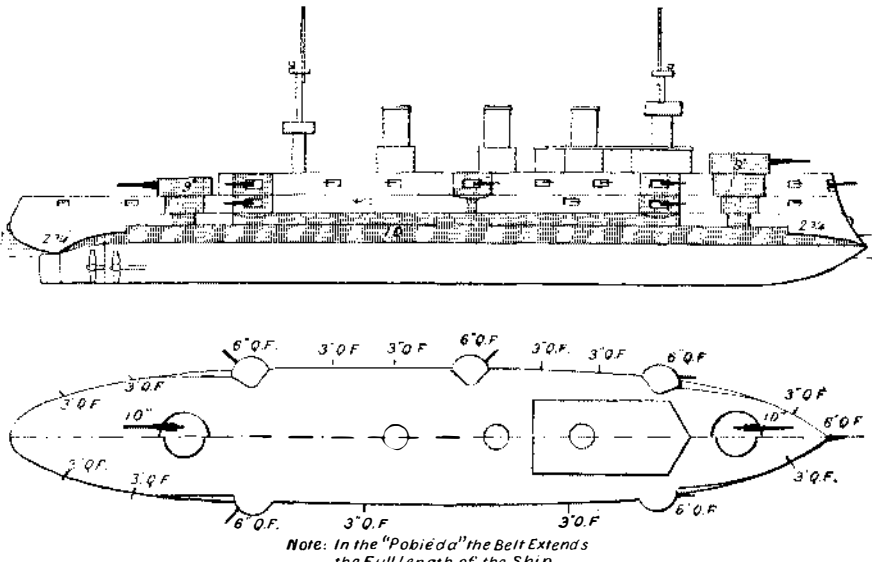
Armored Cruiser "Bayan." Pacific Fleet.  
Displacement, 7,800 tons. Speed, 21 knots.



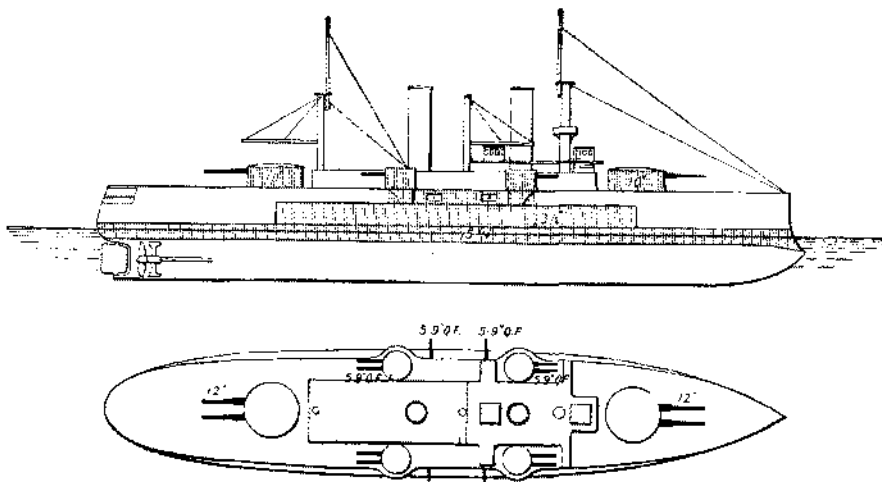
Battleship "Czarevitch."  
Displacement, 13,000 tons. Speed, 18 knots.



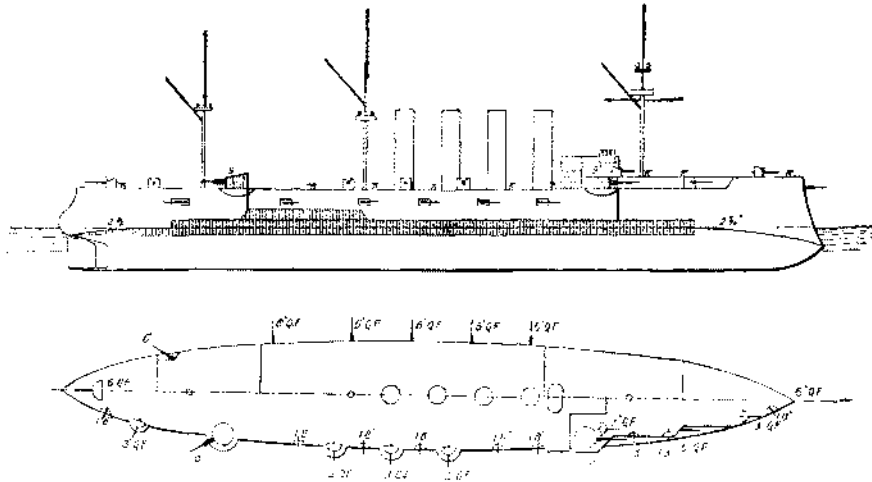
Armored Cruiser "Gromoboi"  
Displacement, 12,367 tons. Speed, 20 knots.



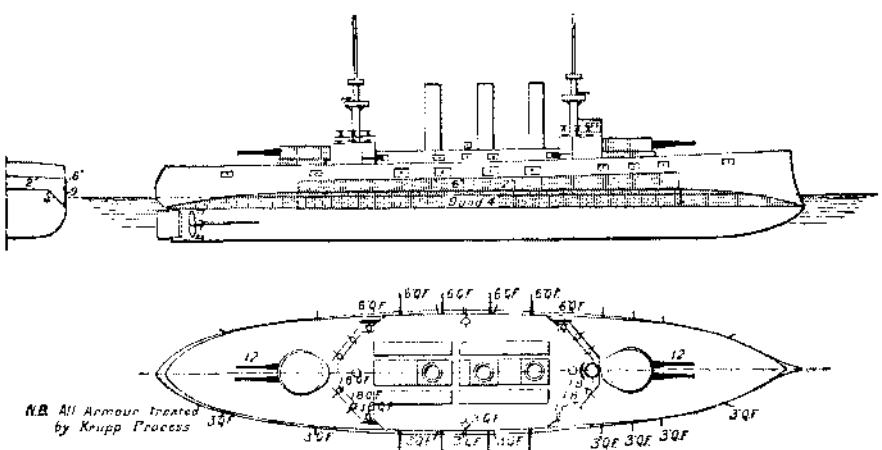
Battleship "Pobieda." Class of Three Ships. Includes "Peresviet" and "Osliabia."  
Displacement, 12,670 tons. Speed, 18 knots.



Battleship "Poltava." Class of Three Ships. Includes "Petropavlovsk" and "Sevastopol."  
Displacement, 11,000 tons. Speed, 17 knots.



Armored Cruiser "Rossia."  
Displacement, 13,500 tons. Speed, 20 knots.



Battleship "Retvizan."  
Displacement, 12,700 tons. Speed, 18.8 knots.

THE RUSSIAN NAVY.

1901, and sunk at Port Arthur. Her displacement is 13,000 tons, and she evidently was so satisfactory to the Russian naval authorities that they took her as a model for the two later classes of battleships above described. She has a continuous belt varying from 10 inches amidships to 2½ inches at the ends. Above this belt is a second complete belt of armor, which extends as high as the gun-deck, and tapers from 6 inches amidships to 2½ inches at the ends. At the top of this belt is the gun-deck, which is formed of 2 inches of steel. The number of guns and the quality of their protection is similar to that of the "Borodino" class, and the distribution of the turrets is about the same. The 12.4-inch guns forward and aft are carried in turrets armed with 11 inches of steel; the twelve 6-inch guns are carried in six turrets protected by 7 inches of steel; while the bases of the turrets are protected by 10 inches of steel in the case of the 12-inch guns, and by 5 inches in the case of the 6-inch guns. There are also two longitudinal bulkheads of 1½-inch steel extending in the wake of the magazines and engine rooms, and located about 9 feet from the side of the vessel. It will thus be seen that the amount of armor carried by this vessel is exceptional, her protection being more complete than that of any ship afloat. The longitudinal bulkheads were supposed to render her torpedo-proof, and it is probable that it was the existence of these bulkheads that served to keep the "Czarevitch" afloat at Port Arthur until she could be brought into harbor and beached. Another peculiar feature in these ships is the heavy concentration of fire forward and aft, which consists of two 12.4-inch guns and eight 6-inch. The loss of the "Czarevitch" removes the finest and most modern of the Russian battleships from the theater of war, probably for many months, if not permanently.

The next two battleships in point of importance are the "Tavricheski" and the "Retvizan," the latter built at Philadelphia in 1900, and torpedoed in the first twenty-four hours of the war at Port Arthur. The "Tavricheski" is of 12,500 tons displacement and 18 knots speed. She is protected by a partial belt, which is 9 inches thick amidships, and by a curved protective deck, which is 4 inches over the vitals and tapers to 3 inches at the ends. Above this belt the side armor is 6 inches in thickness up to the level of the main-deck, and then 5 inches to the level of the spar-deck. The armament consists of four 12-inch guns carried in turrets of 12-inch Krupp armor, and sixteen 6-inch guns, of which twelve are carried on the main-deck within a broadside battery, protected by 5 inches of armor, and four are carried in broadside on the spar-deck behind casemates protected by 5 inches of armor. There are also fourteen 3-inch guns and twenty smaller guns. There is one submerged torpedo tube at the bow below the ram, two submerged torpedo tubes on either broadside near the bow, besides two above-water torpedo tubes. This ship is arranged to burn oil, with facilities for a rapid change to coal fuel, if desired. The "Retvizan," built by Cramps in 1900, is of 12,700 tons, and carries four 12-inch guns protected by 10-inch armor turrets, twelve 6-inch, protected by 5-inch armor, eight of them being carried in a central battery on the gun-deck, four of them in casemates on the main-deck. There are also twenty 3-inch guns mounted on the main-deck in broadside and twenty-six smaller guns. The vessel has two submerged and four above-water torpedo tubes. She has a partial belt which varies from 9 inches to 7 inches in thickness and a 3-inch protective deck. This fine vessel made 18.8 knots on her trial, and can carry a maximum coal supply of 2,000 tons. Like the "Czarevitch," she is now the victim of the Japanese torpedoes, and has been beached on the mud inside the harbor of Port Arthur.

The "Poltava" class of three battleships, built in 1894-1895, forms part of the fleet at Port Arthur. The "Poltava" herself was an-

RUSSIAN FLEET AT COMMENCEMENT OF THE WAR.					SHIPS DISABLED IN FIRST 24 HOURS OF WAR.			
	Number of Ships.	Average speed in knots.	Average displacement in tons.	Displacement in tons.	Number of Ships.	Average speed in knots.	Average displacement in tons.	Displacement in tons.
Battleships, 10 years old or less	13	17.3	11,790	153,276	3	18	12,233	36,700
Battleships, 10 to 20 years old or less	7	16.0	9,933	69,800				
Totals	20	16.6	10,861.5	223,076	3	18	12,233	36,700
Coast Defense Vessels	3	16.0	4,129	12,387				
Armored Cruisers, 9,000 tons or over	3	19.6	11,979	35,817				
Armored Cruisers, 7,000 to 9,000 tons	2	20.0	7,900	15,800				
Totals	5	19.8	9,439.5	51,617				
Protected Cruisers, 4,000 to 7,000 tons	11	20.2	6,352	69,880	4	22	6,500	26,000
Protected Cruisers, 2,000 to 4,000 tons	6	23.4	3,250	19,500	2	24.2	3,100	6,200
Totals	17	21.8	4,800.7	89,380	6	23.1	4,800	32,200
Small Cruisers and Gunboats	13	18.5	846	11,000	2	11	1,500	3,000
Grand Totals	58	18.8	3,000.0	387,260	11	17.6	2,800	41,900
Destroyers	50	27.5	300	15,000				
Torpedo Boats, 1st Class	54	24	120	6,480				
Torpedo Boats, 2nd Class	12	21	85	1,020				
Totals	116	25.5	105	22,500				
Obsolete Torpedo Boats	100							

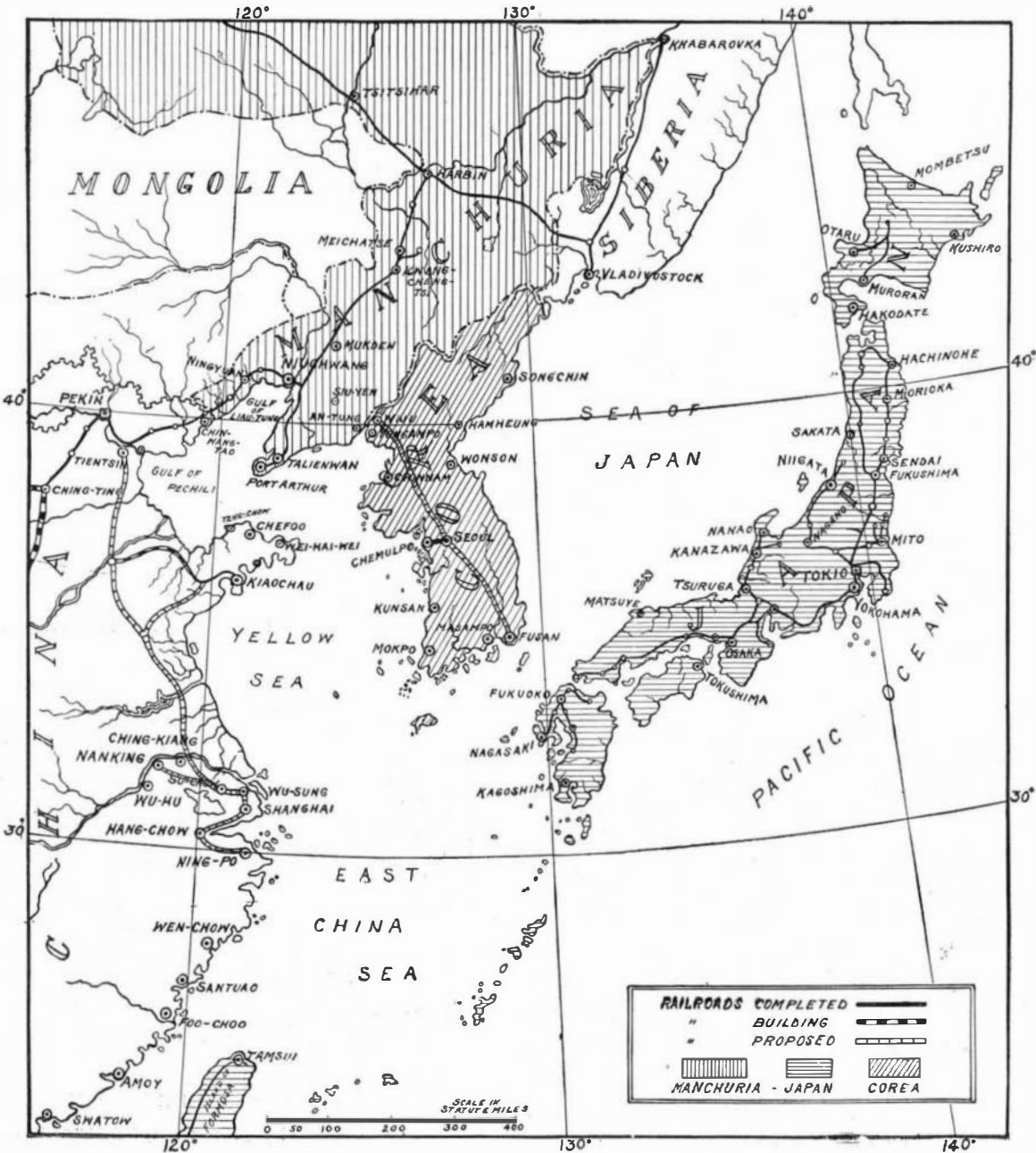
other of the victims of the great sea fight, being crippled by a hole below the waterline. The other two ships, the "Petrovsk" and the "Sevastopol," are similar vessels of 11,000 tons and 17 knots speed, protected by a partial belt of 15-inch Harvey armor, a 3½-inch protective deck, with 9-inch transverse bulkheads at the ends of the armor belt. Above the belt, for the height of one deck, the side armor is 4 inches in thickness. The armament consists of four 12-inch guns carried in 10-inch armor turrets with 6-inch armor bases, eight 6-inch guns carried in 6-inch armor turrets with 5-inch armor bases, these turrets being arranged two on each broadside, so that four of them can fire dead ahead and four dead astern. There are also four 6-inch guns, two on each broadside on the

main-deck between the turrets and protected by 5-inch armor casemates. There are also sixteen 3-pounders and twenty smaller guns. Each vessel carries six above-water torpedo tubes.

The battleship "Tri-Sviatitelia" of 12,500 tons and 18 knots speed, built in 1893, is a low-freeboard vessel with a partial belt of 16-inch Creusot armor and a 3-inch deck, and is of considerably less value than the preceding ships. There are four 12-inch guns carried in two 16-inch armor turrets mounted on 16-inch armor redoubts. There are eight 6-inch guns mounted behind a 5-inch armor broadside battery on the main deck and four 4.7-inch guns mounted on the spar-deck. The vessel can carry 1,000 tons of coal, and was designed for a speed of 18 knots. The "Rostislav," built

in 1897, of 9,000 tons and 18 knots speed, and the "Sissoi Veliky," of the same tonnage and 16 knots speed, are practically sister ships, with partial belts. They mount their main armament of four 12-inch guns in two turrets. The "Rostislav" carries her intermediate battery of 6-inch guns in four 6-inch armor turrets, two on each broadside; the sister ship carries her six 6-inch guns in a central battery protected by 5-inch armor. Each vessel has six above-water torpedo tubes. The waterline belt of the "Rostislav" is of 15-inch Harvey armor, and that of the sister ship of 16-inch Creusot armor.

Three of the finest battleships in the Russian navy are the sister ships "Pobleda," "Peresviet," and "Osliabia," of 12,670 tons and 18 knots speed. They are ships of extremely high freeboard, a good thing for the guns, but a very bad thing for the ship herself, considered as a target for the enemy. They have Harvey belts of 9 to 4-inch armor, with a belt of 5-inch armor extending amidships above the main belt. They carry four 10-inch guns in 10-inch armor turrets, ten 6-inch guns in 5-inch armor casemates, and one 6-inch gun firing through the bow on the main-deck. There are also twenty 3-inch and twenty-six smaller guns, two submerged torpedo tubes and four tubes above water. These three vessels are in the Pacific, and escaped in-



MAP OF THE THEATER OF THE RUSSO-JAPANESE WAR.

jury as far as known in the recent fighting. Of less important battleships on the European station, there are the "Navarin," of 10,000 tons and 16 knots speed, and the "Apostoloff," 8,500 tons and 16½ knots speed, whose main armament consists of four 12-inch guns in turrets and, in the case of the "Navarin," eight 6-inch guns in broadside, and in the case of the sister ship four 6-inch guns mounted in broadside. These vessels have partial belts of compound armor. Of course, they are now relegated purely to duties of coast defense. Then there are the three vessels of the "Sinop" class, of 10,500 tons displacement and 16½ knots speed. They have 16-inch belts, and a 12-inch central redoubt, within which are six 12-inch guns, protected by the redoubts and by hoods of 2-inch armor. These vessels also carry seven 6-inch guns on the main-deck. The "Nikolai I." and "Alexander II." are old battleships of 9,800 tons and 15½ knots speed, protected with 14-inch compound armor belts and carrying two 12-inch guns in a turret forward and four 9-inch and eight 6-inch in a battery on the gun-deck.

The Russian navy also includes three fairly modern coast defense vessels built in 1895, of 4,126 tons and 14 knots speed. They carry some of them three and some of them four 9-inch guns in turrets, and four 6-inch guns in the central battery. They have a partial 10-inch belt, and a 3-inch armored deck.

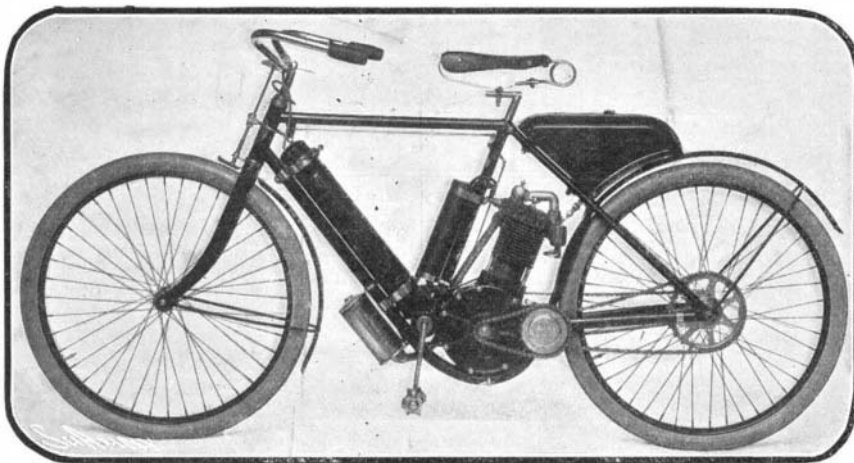
The Russian navy includes four large modern armored cruisers. The "Gromoboi," built in 1899, is of 12,367 tons and 20 knots speed, with a bunker capacity of 2,500 tons of coal, and provision for liquid fuel. The vessel has a partial 6-inch belt, a 2-inch deck, and 6 inches of armor on the casemates. She carries four 8.4-inch guns, sixteen 6-inch, twenty 3-inch, and twenty-four smaller guns, besides two submerged and two above-water torpedo tubes. She is practically an improved "Rossia," and the description of the "Gromoboi" will apply to the "Rossia," with the difference that the armor belt is 10 to 5 inches in thickness, and that she carries six above-water torpedo tubes. The "Rurik," of 10,950 tons and 18.8 knots speed, has a partial 10 to 5-inch belt and carries four 8-inch, sixteen 5.5-inch, six 4.7-inch, twenty-two smaller guns, and six above-water torpedo tubes. Although much smaller than the other vessels, the "Bayan," built at La Seyne in 1900, is the best designed of the armored cruisers. She is of 7,800 tons and 21 knots speed, has an 8 to 4-inch belt, 2-inch deck, and carries two 8-inch guns in 7-inch armored turrets, eight 6-inch guns in 6½-inch armor casemates, twenty 3-inch and seven smaller guns, besides two submerged torpedo tubes. There is also the "Nakhimoff," built in 1885, and rebuilt in 1899, which carries a 10-inch partial compound armor belt and mounts eight 6-inch, ten 4.7-inch, and several smaller guns.

Coming now to the protected cruisers, we have a class of six splendid vessels of about 6,500 tons displacement and speeds that vary from 20 to 24 knots. They have about the same armor and armament; and a description of the "Variag," which was built at Philadelphia and destroyed in the recent sea fight off Chemulpo, will answer for the class.

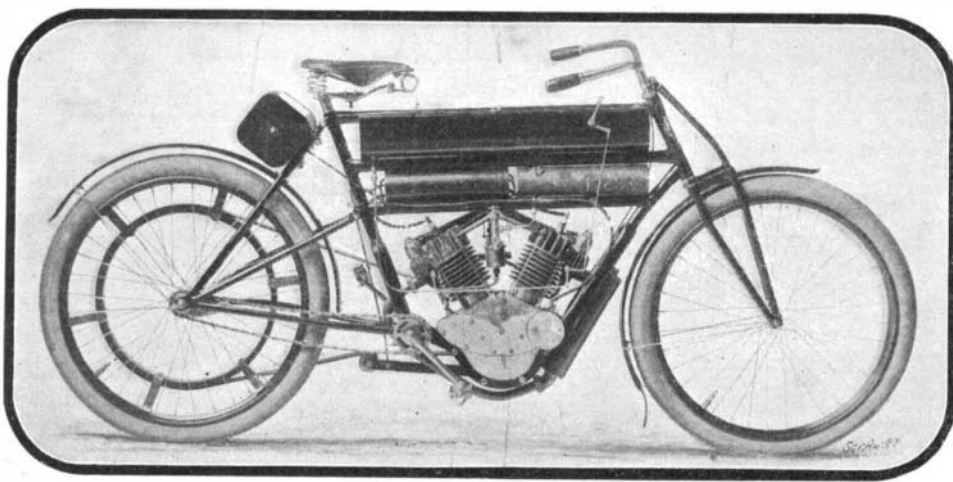
The "Variag" is, or rather was, of 6,500 tons displacement, 24.6 knots speed, and was protected by a 3-inch deck and by gun shields 6 inches or less in thickness. She carried twelve 6-inch, twelve 3-inch, and six smaller guns, besides two submerged and two above-water torpedo tubes. The other vessels of this class are the "Bogatyr," built at Stettin; the "Askold," a five-funneled boat built by Krupp; the "Pallada" and "Diana," both crippled at Port Arthur; and the "Aurora." Of the four other large protected cruisers, it is sufficient to say that, because of their age, they are in no way comparable to the foregoing ships. The

"Pamiat-Azova," of 6,700 tons and 18.8 knots, is the best. She carries fourteen 6-inch guns, and has a partial belt of the old compound armor, which is not comparable in protective qualities to the modern steel protective decks. The "Dimitri Donskoi," of 5,800 tons, now on her way to the Pacific, and two other vessels, the "Monomakh" and "Korniloff," are protected by easily-penetrated compound-armor belts, and are armed with a numerous battery of 6-inch and 4.7-inch

Besides these there are over 100 small torpedo boats of such early construction as to be practically obsolete. Before the opening of the war the personnel of the Russian fleet was something of an unknown quantity. It was supposed, however, to be very good; but until some reasonable explanations are forthcoming of the early reverses of the war, the public will conclude that the excellent Russian ships and general war material are vastly superior to the men who handle them.



2½ H. P. COLUMBIA MOTOR BICYCLE.



5 H. P. TWIN-CYLINDER CURTIS ROADSTER.

guns. They are of slow speed and doubtful utility against modern ships. The "Svietlana," built at Havre in 1896, is a serviceable 3,900-ton ship of 20 knots speed, with a 2-inch deck, mounting six 6-inch, twelve 3-pounders, and four above-water torpedo tubes. The "Novik," the fastest protected cruiser in the world, now disabled at Port Arthur, and the "Almaz" are 3,000-ton protected cruisers of 26 knots speed, carrying six 4.7-inch guns and eleven smaller guns. They have a 2-inch deck, and are provided with five torpedo tubes, all located above the water line. Lastly, we have the three vessels of the "Boyarin" class, of 3,200 tons displacement and 22½ knots speed, protected by a 2-inch deck and carrying six 4.7-inch guns, eight smaller guns, and five above-water torpedo tubes. The "Boyarin" is another of the ships that was disabled at Port Arthur.

In addition Russia also possesses thirteen small cruisers and gunboats that range from 1,500 to 534 tons in displacement, two of the best of which have already been accounted for by the Japanese in the early days of the war. The torpedo-boat fleet consists of fifty destroyers, fifty-four first-class and twelve second-class torpedo boats, all of modern and first-class construction.

and 10 miles in 8:45 2-5 on the Ormond-Daytona Beach.

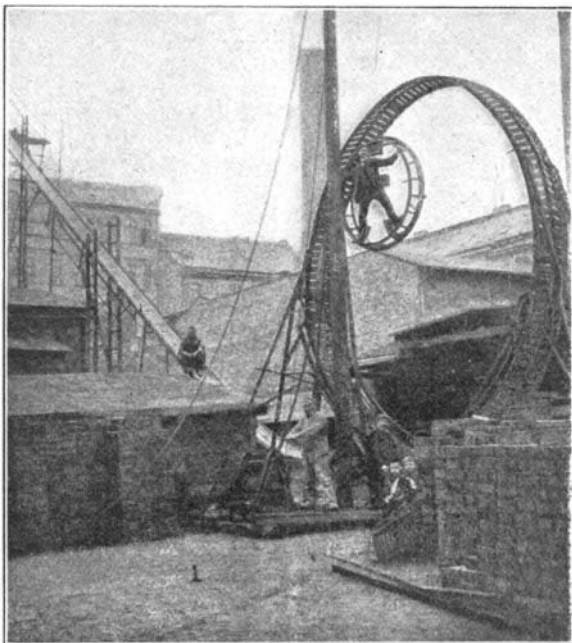
The switch and spark advance are controlled by turning the left grip, while the exhaust valves can be raised by a small lever on the frame. The batteries and spark coils are placed across the upper part of the frame, the gasoline tank behind the seat. The carburetor is seen between the two cylinders of the motor. The company also builds a single-cylinder, 120-pound, 2½-horsepower machine. The two sizes of machines are respectively fitted with 2½ and 2-inch detachable tires, and have a 62 and 58-inch wheel base.

The new Columbia motor bicycle, built by the Pope Manufacturing Company, of Hartford, Conn., has a chain drive through a speed-reducing countershaft to the rear wheel. The sprocket of the former, on which runs the chain from the motor, is fitted with two coiled springs, which transmit the power, yet absorb the shocks of the explosions. The motor has a 2¾-inch bore and a 3¼-inch stroke. High compression is used in it, and, at a speed of 2,500 R. P. M., it will drive the bicycle 35 miles an hour. All the Columbia machines are run up a hill of 25 per cent grade, which they must climb at a 15-mile-an-hour rate as a final test. The arrangement of parts is readily seen in the cut. The batteries are in a case above the lower

tube of the frame; the muffler is just below this tube; the spark coil is on the upright post; and the tank is over the rear wheel. The machine is controlled entirely by the lever of the plunger brake. Pushing this down speeds up the motor, and pulling it up slows it down and applies the brake. The inlet valve stem and spring is exposed. Both inlet and exhaust valves can be readily removed.

#### SOMERSAULT MONOCYCLE COURSE.

In the present era of "weak nerves," the performance of "looping the loop," in which a cyclist traverses a vertically placed loop, has quickly staled, and has now been



ECLAIR'S SOMERSAULT MONOCYCLE COURSE.



MR. ECLAIR IN HIS WHEEL.



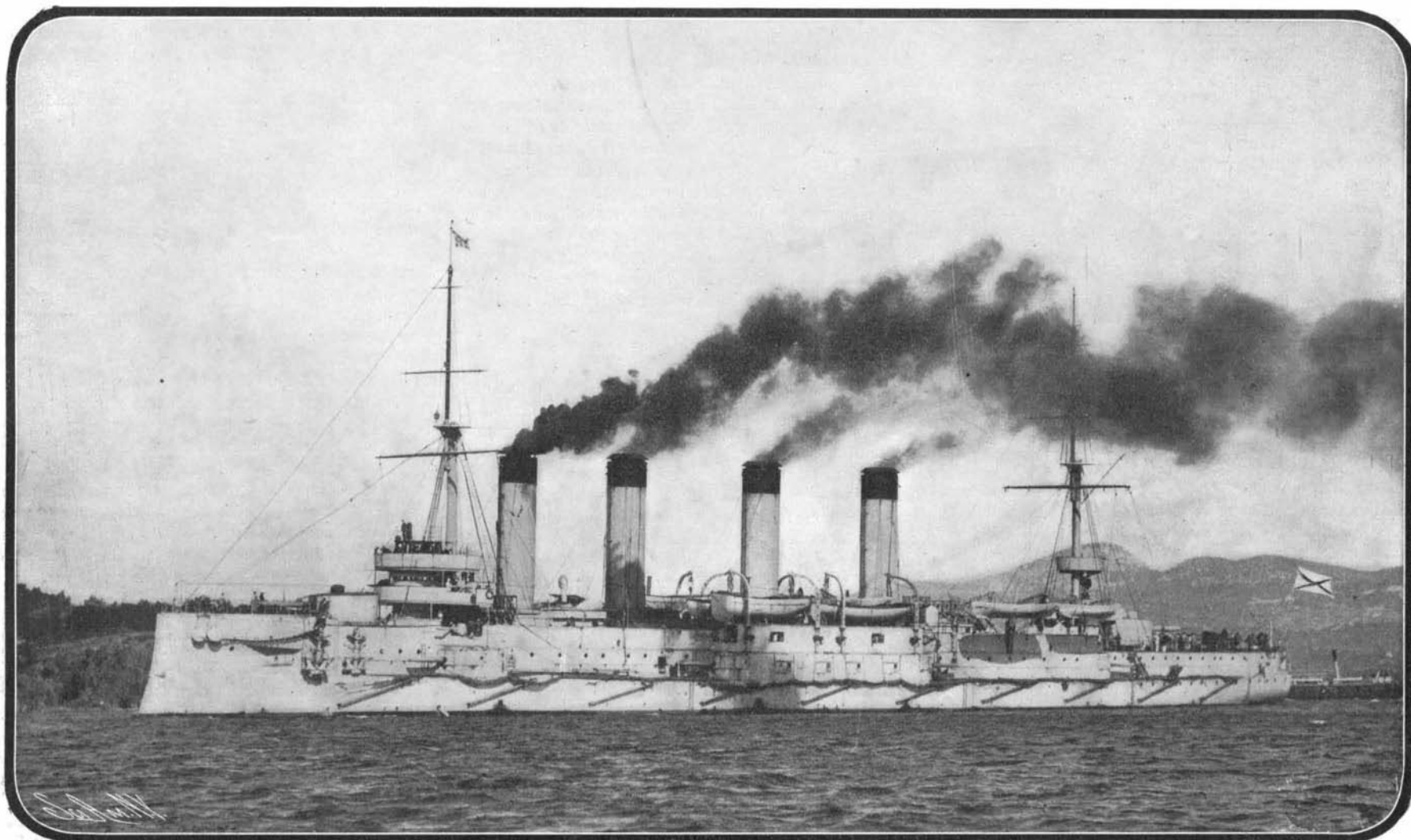
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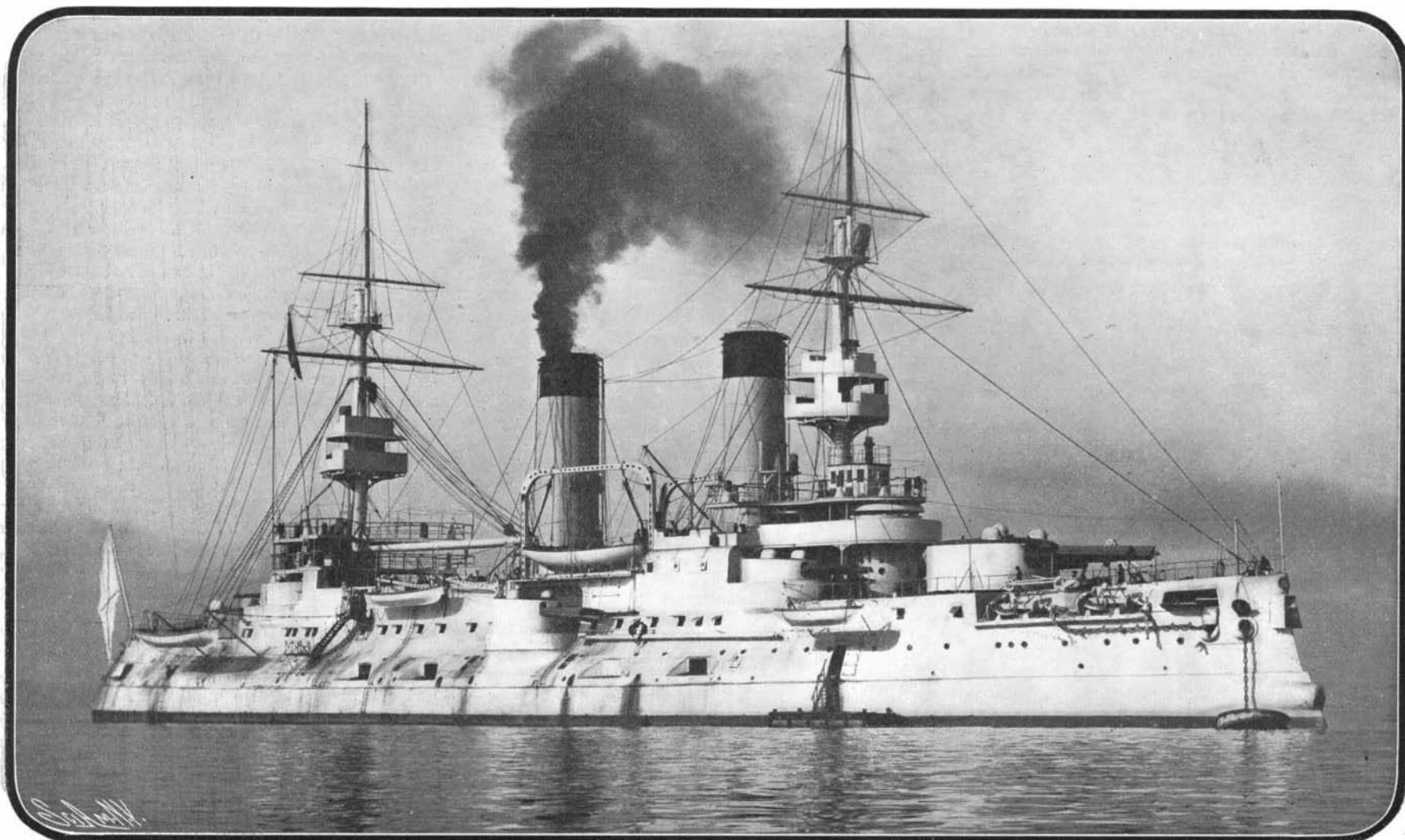
NEW YORK, FEBRUARY 20, 1904.

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**Displacement,** 7,800 tons. **Speed,** 21 knots. **Coal,** 1,100 tons. **Armor** (Krupp): Belt, 8 in. to 4 in.; Deck, 2 in.; Gun positions, 7 in. to 6½ in. **Guns:** Two 8-in.; eight 6-in.; twenty 3-in.; seven smaller guns. **Torpedo tubes:** 2 submerged.

**ARMORED CRUISER "BAYAN." DATE, 1900. NOW IN THE PACIFIC FLEET.**



**Displacement,** 13,000 tons. **Speed,** 18 knots. **Coal,** 1,250 tons. **Armor** (Krupp): Complete waterline belt, 10 in. to 4½ in.; Complete belt above this, 8 ft. deep, 6 in. to 2½ in.; Protective deck, 4 in. on slopes; Gun deck, 2 in.; Main turrets, 11 in.; 6-in. gun turrets, 7 in.; Ammunition hoists, 10 in. and 5 in. **Guns:** Four 12.4-in.; Twelve 6-in.; Twenty 3-in.; Twenty-eight small guns. **Torpedo tubes:** 2 under and 2 above water.

**THE FINEST BATTLESHIP IN THE RUSSIAN NAVY, "CZAREVITCH." BUILT 1901. SUNK AT PORT ARTHUR.—[See page 157.]**