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Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK

Royal United Services Institution. Journal

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rusi19>

Naval Notes

Secretary V. H. Metcalf

Published online: 11 Sep 2009.

To cite this article: Secretary V. H. Metcalf (1908) Naval Notes, Royal United Services Institution. Journal, 52:366, 1113-1123, DOI: [10.1080/03071840809418915](https://doi.org/10.1080/03071840809418915)

To link to this article: <http://dx.doi.org/10.1080/03071840809418915>

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NAVAL NOTES.

The following are the principal appointments which have been made: Captains—L. G. Tufnell, C.M.G., to Command of Royal Naval Engineering College; C. F. Thursby to "Swiftsure"; H. W. Grant to "Albemarle"; P. W. Dumas, M.V.O., to "Hermes"; R. Y. Tyrwhitt to "Hecla." Commanders—C. T. Borrett to "Clio"; E. la T. Leatham to "Proserpine."

Rear-Admiral Sir Percy Scott, K.C.V.O., C.B., has been selected to command a squadron of first-class armoured cruisers, which is to visit South Africa during the autumn. The squadron is to consist of the *Good Hope* (Sir Percy's flag-ship), *Antrim*, *Carnarvon*, and *Devonshire*, belonging to the Second Cruiser Squadron. Rear-Admiral C. H. Adair, commanding the Second Cruiser Squadron, will remain in the *Drake*, his present flag-ship, and take command of the First Cruiser Squadron in Sir Percy Scott's place.

A second group of special service cruisers, consisting of the *Ariadne* (parent ship), *Spartiate*, *Sappho*, and *Pandora*, has been formed at Portsmouth. The other groups of special service ships at the port will then be composed of the battle-ships *Barfleur* (parent ship), *Centurion*, and *Renown*, and the cruisers *Royal Arthur* (parent ship), *Edgar*, *Hawke*, and *Crescent*.

The first-class armoured cruiser *Indomitable*, with H.R.H. the Prince of Wales on board, arrived in Cowes Road at 9.40 p.m. on the 3rd inst., after a record run from Quebec. She left Quebec at 3 a.m. on Wednesday, 29th ult., her instructions being to make her passage to Cowes at her utmost sea-going speed, as a long-distance trial. After getting clear of the Straits of Belle Isle, where she got fairly out into the open sea, she seems to have averaged between 25 and 26 knots on her passage home, and this without pressing the ship to her full power, and with two of her turbines disconnected.

The *Indomitable* was laid down by the Fairfield Company at Govan in March, 1906, and launched well advanced in March, 1907, having thus been only twelve months on the slip. The new vessel was completed very rapidly, and handed over by the builders for her trials in April of the present year. It was not considered desirable by the Admiralty to make public full particulars of the trials, but it is known that, as regards speed attained and coal consumption, they were most satisfactory. The contract speed was 25 knots, but it is credibly reported that the vessel reached a much higher speed, and attained 27 knots for a considerable period. At least, it seems clear that she is capable of maintaining easily more than the required speed of 25 knots.

Her dimensions are as follows:—Length at the water-line, 530 feet; beam, 78 feet 6 inches; draught, about 26 feet, with, according to the Navy List, a displacement of 17,250 tons; but it is probable that

Home. with her maximum supply of coal on board, her displacement is nearer 19,000 tons. The main armament consists of eight 50-calibre 12-inch guns (firing a projectile weighing 850 pounds, with a muzzle velocity of 3,010 foot-seconds), mounted in pairs in barbette turrets. One turret is forward and another abaft, while the other two are amidships, placed in echelon. The object of this arrangement is to enable all the big guns to be fired on either broadside or broad on the bow or quarter, and six of them directly ahead or astern. In addition, there are about sixteen 4-inch guns of the new model for anti-torpedo-boat work. Protection is afforded by a Krupp steel belt 7 inches thick amidships and to the base of the turrets, diminishing to 4 inches at the bow and the stern. The turrets are variously said to be protected by 8 inches and 10 inches of steel. The machinery consists of Babcock and Wilcox water-tube boilers, designed for 41,000-H.P. at 25 knots, with Parsons' turbines. The normal coal supply is 1,000 tons, but the maximum bunker capacity is 2,000 tons at least, in addition to oil fuel.—*Resumé from Times.*

The Dilke Return of British and Foreign Fleets.—The "Dilke Return" [Parliamentary Paper, No. 277], "showing the Fleets of Great Britain, France, Russia, Germany, Italy, United States of America, and Japan on the 31st day of March, 1908," which has just been issued, is in the customary form. It is a nominal list, all ships in their several classes being placed together; but particular vessels which have been condemned or are "of no fighting value" are indicated; in the latter category are the French *Magenta*, *Formidable*, *Amiral Baudin*, *Courbet*, and *Dévastation*; but such old and useless vessels for fighting purposes as the Italian *Dandolo* and *Castelfidardo* and the Japanese *Chinyen* remain as if on the effective list.

The following explanatory note is attached :—

"1. All vessels of each Navy which still retain their armaments, and are not for sale, are shown in this return. A fair comparison between the older vessels of each Power may be obtained by reference to their respective ages, displacements, armaments, etc.

"2. Vessels are arranged in classes as follows :—

- Battle-ships.
- Coast-defence vessels (armoured).
- Cruisers (armoured).
- Cruisers (protected), 1st class
- Cruisers (protected), 2nd class.
- Cruisers (protected), 3rd class.
- Cruisers (unprotected).
- Scouts.
- Torpedo vessels.
- Torpedo-boat destroyers.
- Torpedo-boats.
- Submarines.

"3. Vessels built are shown separately from those building, and vessels are not transferred from the "building" to the "built" section until they have completed their trials and are ready for commissioning.

"4. In each class, vessels are arranged in types, the latest designed type being placed first in the case of those built, and last in the case of those building.

"5. A nominal statement prefaces each class.

"6. In the column headed "horse-power," the figures are to be taken as representing maximum I.H.P. (= indicated horse-power), except where they are followed by the letter T, which indicates that turbine machinery is fitted."

The following is a summary of the different classes of ships:—

Battle-ships.—Great Britain, 59 built, 8 building; France, 31 built (including 6 condemned), 7 building; Russia, 10 built, 5 building; Germany, 34 built, 9 building; Italy, 16 built (including 2 condemned), 3 building; United States, 25 built, 5 building; Japan, 15 built, 4 building.

Coast-defence Vessels.—Great Britain, *nil*; France, 7; Russia, 2; Germany, 11; Italy, *nil*; United States, 11; Japan 1. None building.

Armoured Cruisers.—Great Britain, 34 built, 4 building; France 18 built, 4 building; Russia, 8 built, 2 building; Germany, 8 built, 3 building; Italy, 6 built, 4 building; United States, 13 built, 2 building; Japan, 10 built, 3 building.

Protected Cruisers (First-class).—Great Britain, 21; France, 5; Russia, 7; Germany and Italy, *nil*; United States, 3; Japan, 2. None building. *Second-class*.—Great Britain, 42 built; France, 12 built; Germany, 19 built, 7 building; Italy, 4 built; United States, 16 built; Japan, 11 built, 1 building. *Third-class*.—Great Britain, 16; France, 11; Russia, 1; Germany, 12; Italy, 12; United States, 2; Japan, 8. None building.

Unprotected Cruisers.—Great Britain, 1 building; France, 2 built; Russia, 2 built; Germany, 13 built; Italy, *nil*; United States, 10 built; Japan, 5 built, 1 building.

Scouts.—Great Britain, 8 built; other Navies, *nil*; United States, 3 building.

Torpedo Vessels.—Great Britain, 19; France, 13; Russia, 6; Germany, 1; Italy, 9; United States, 2; Japan, 1.

Destroyers.—Great Britain, 141 built, 13 building; France, 42 built, 23 building; Russia, 93 built, 4 building; Germany, 58 built, 27 building; Italy, 17 built, *nil* building; United States, 20 built, 5 building; Japan, 54 built, 4 building.

Torpedo-boats (Formerly Coastal Destroyers). — Great Britain, 36. General List.—Great Britain, 82; France, 284; Russia, 85; Germany, 83; Italy, 125, 1 building; United States, 32; Japan, 79.

Submarines.—Great Britain, 42 built, 18 building; France, 43 built, 40 building; Russia, 24 built, 12 building; Germany, 1 built, 2 building; Italy, 4 built, 2 building; United States, 12 built, 8 building; Japan, 7 built, 5 building.

The following are the principal appointments which have been made: Capitaines de Vaisseau—J. J. Kéraudren to "Duguay-Trouin"; L. E. A. Jochaud du Plessix to "Bruix." Capitaines de Frégate—F. J. Ravoux to Command of First Mediterranean Submarine Flotilla; A. M. Larixade to "Latouche-Tréville"; J. M. Burel to "Cécille"; G. A. Eng to "Lahire."

France. *Steam Trials.*—During a recent full-speed trial at four-fifths power of the Mediterranean Fleet, the new battle-ships of the 1900 programme showed a marked superiority over the older ships. The *Patrie*, *Démocratie*, and *République* averaged respectively 18, 17.75, and 17.25 knots during the run, while the *Bouvet*, a ship hardly yet ten years old, only made 12, and the *Suffren*, a comparatively speaking new ship, made 14 knots only. Curiously enough, the *Arbalète*, one of the older destroyers with a nominal speed of 26 knots, made 21.1, while the *Coutelas*, a quite new vessel with a nominal speed of 28 knots, only achieved 20.8 knots; there was a heavy sea for this class of vessel running at the time.

The new first-class armoured cruiser *Jules Michelet* has successfully completed her preliminary trials at Brest. She first made a four hours' run at normal speed, after which the engines were gradually worked up without difficulty to 26,850-I.H.P. On the following day, during a four hours' run at full speed the engines developed 29,000-I.H.P., giving a speed of 23.2 knots, or a knot over the contract. Her boilers are of the Temple-Guyot type, and her consumption of coal at 29,000-I.H.P. did not exceed 860 gr. (1½ lbs.) per indicated horse-power per hour. The new first-class armoured cruiser *Ernest Renan* has also had a successful preliminary trial off Toulon, when, with the engines developing 31,000-I.H.P., she made a speed of 22 knots. Her boilers are of the Niclausse type, and it is expected that with the engines developing 36,000-I.H.P., the contract speed of 23 knots will be exceeded.

Submarine and Submersible Trials.—An interesting trial is to be made by order of the Minister of Marine between the new submersible *Pluviôse* and the new submarine *Emeraude*. The programme has been drawn up by the authorities at Cherbourg, and will consist of a run from Cherbourg to Brest, from Brest to Dunkirk, and then back to Cherbourg without stopping at any port. In some comparative trials made some two years ago between the submarine *Z* and the submersible *Aigrette*, the results were absolutely in favour of the latter. The *Pluviôse* at her trial trip gave a speed of 12 knots on the surface and 7.7 knots when submerged; the *Emeraude* made 11.6 knots on the surface and 9 knots when submerged. The displacement and engine power of both vessels are about the same, the latter developing from 340 to 350-H.P., so the two vessels are, on the whole, fairly matched.—*Le Yacht and La Vie Maritime*.

The Naval Situation, by M. Rousseau. Letter II.—At the commencement of the 20th century England proclaimed her splendid isolation. As an island Power she had organised a navy strong enough to allow her to pursue her political aims with a free hand. She had successfully concluded an anxious war in the Transvaal which her finances had been able to support without serious difficulty, and in 1901 the additions to her war fleet were more considerable than in any previous period. Her position seemed stronger, her domination more firmly established than ever.

But in 1902 a small dark spot began to show in the hitherto cloudless sky. The mother country began to feel the weight of the burden of naval defences and demanded a larger contribution from the colonies, giving as a reason that the fleet not only gave security to the United Kingdom and its commerce, but assured also by its protection the prosperity of the colonial

possessions and guaranteed their commercial and industrial development. Taking the opportunity of a conference of the colonial premiers, the Admiralty expounded the great principles on which the Empire of the sea reposes, the guiding rules of naval strategy being set forth in a memorandum of remarkable power.

The thesis sustained in this memorandum is as follows :—Without supremacy at sea ocean communication is insecure and all expeditions across the sea are hazardous. This supremacy can only be held by means of great naval battles and victories effecting the destruction of the enemies' fleets, and for success a rapid concentration of the naval forces is necessary. Concentration implies an homogeneous navy under a single command capable of assuring the action of all its parts. Nothing should be allowed to interfere with the fleet taking the offensive, local defensive action should be put aside, the fleet should concentrate all its efforts upon attacking the enemy's ships.

These principles, whose value is allowed by all who have formed a clear conception of the rôle of the Navy, were applied by the British Admiralty two years later in the most thorough manner, thanks to the facilities of modern science.

It is indispensable for the proper concentration and unity of a fleet that all parts should be in direct relation with one another, hence the necessity for possessing regular and continuous means of communication. When Lord Selborne was First Lord in 1904 he issued a memorandum on the new distribution of the fleet, in which, conforming to these principles, he said: "The basis on which reposes the distribution of ships on their different stations in times of peace 'dates from an epoch before the electric telegraph, and when wind was the only motive power.'" This phrase alone justified the redistribution of the British naval forces till then dispersed on the different seas in proportion to the strength of foreign fleets in those waters which might possibly become enemies.

It was after 1904 that the British Fleet effected its concentration, each of its parts being in close communication. The new arrangement may be summarised as follows :—Three fleets of battle-ships have for their respective bases the Channel, Gibraltar, and Malta; attached to the three fleets are three cruiser squadrons. These three fleets, with their cruiser squadrons, are the British naval forces in European waters, their common action is provided for and they unite annually for manœuvres. The cruisers stationed on distant stations are also divided into three groups. The Eastern group consists of the ships on the China, East Indian and Australian stations. The group at the Cape of Good Hope unites the Eastern to the Western group, which is stationed on the American side of the Atlantic Ocean. Thanks to this distribution the British Fleet is in contact with all the naval Powers of the world and can concentrate on any point of the globe, the cohesion of its different parts being assured. This new organisation is the application of a French idea proposed before the memorandum to the Colonial Conference saw the light. The honour of the conception of so grouping fleets that they can be of support to each other belongs to M. de Lanessan. The reform, however, was not appreciated by his successor, who made haste to destroy it, nor even, perhaps, by our own admirals, who are little used to the consideration of the larger problems of naval strategy. M. de Lanessan created a naval force in Chinese waters

by uniting the squadrons of the Far East, the Indian Ocean, and the Pacific, which was to include twelve armoured cruisers, six being stationed in China and the others forming a flying squadron destined to cruise in the triangle formed by the three *points d'appui* of Saigon, Diego-Suarez and Nouméa. The minister also created a naval force in the Atlantic attaching to the northern squadron stationed at Brest and Cherbourg a division of cruisers in American waters, the squadron and division being united under the same commander-in-chief.

These proposed reforms of M. de Lanessan were certainly the prototype for the redistribution of the British Fleet, and the reply of the Admiralty to the creation of a new French naval force in the Far East was the connection established between the British naval forces in China, Australia and India, and the annual meeting of the three Commanders-in-Chief of those stations at Singapore to concert a common plan of action.

The redistribution of the British Fleet in 1904 was but an extension of the French idea. Since 1904 many changes have been made and these have always tended to assist concentration. They were justified in the memorandum issued by Lord Cawdor: "Fleets of different strength are necessitated by strategy in certain waters, but the kaleidoscopic nature of international relations are opposed to any permanent allocation of our effective ships, and show also the necessity of a periodical repartition of the ships of our fleets to satisfy the political needs of the moment." By these successive changes British waters have become the station of nearly the entire English Fleet. A fourth battle-ship force has been added to the three of 1904. The Home Fleet, which had been abolished, has been re-constituted; it comprises a division always in commission composed of the newest and most powerful battle-ships, and the *Dreadnought* flies the flag of its Commander-in-Chief. It is to this fleet that have been attributed the two battle-ships of the *Nelson* class, the three new armoured cruisers of the *Invincible* type carrying 305 mm. guns, six other armoured cruisers, a flotilla of 24 destroyers, and a flotilla of six submarines. This division of the Home Fleet is a most formidable one, it possesses superior speed to that of any other constituted fleet, and is the most perfect fighting force existing, destined to and capable of striking hard before even its attack is expected.

If we add that England also has in full commission the three fleets containing 26 modern battle-ships and the four squadrons with 17 armoured cruisers, not counting the reserve divisions at Portsmouth and Devonport, and that she also possesses a most perfectly organised flotilla of torpedo vessels and 40 or so submarines, we are lost in admiration of this gigantic organisation for war, concentrated, held in leash, ready to be launched towards any point of the horizon.

In making a study of the British Fleet one is at a loss to know whether to admire most the effective naval force that has been constituted or the technical and administrative organisation that has produced such results. For the last four years England has reduced her naval budget, and, notwithstanding, her armaments do not seem to have diminished and the production of her dockyards has not failed. The Admiralty up to the present has been able to provide for everything; how this surprising result has been obtained we need not consider, we must face an accomplished fact knowing

that no sacrifice has been thought too great. England has not hesitated to discharge a large number of dockyard workmen and to strike off the list in one year about 100 cruisers of doubtful military value whose cost of up-keep was thought to be too heavy for their uncertain value.

On the other hand, the new distribution of the fleet allowed of certain economies being made, especially as regards the expenses of keeping up certain naval yards on distant stations. The table annexed to Lord Cawdor's memorandum shows that the new organisation effects a reduction of 32,000,000 francs (£1,280,000), of which 21,500,000 francs (£860,000) are saved on the upkeep of inefficient ships and by the disappearance in the estimates of the dockyards of Jamaica, Halifax, Esquimaux and Trincomalee, and the reduction of expenses at Ascension, Cape of Good Hope and Bermuda, which formerly absorbed 3,750,000 francs (£149,000), by one half.

Thus the Admiralty has been able to effect the *tour de force* of modernising the navy and at the same time making it less costly. In fact, at the present moment the British Navy is formidable and ready at all points and fully complies with the criterion adopted by England known as the two-Power standard. Nevertheless, as we stated in our first article, the future does not appear assured, fissures are already becoming visible in this admirable organisation, the mother country finds it hard to support the great weight of her naval expenses, the colonies do not increase their contributions, and the last First Lord, Lord Tweedmouth, has been obliged to confess that there was reason to anticipate a further increase in expenses on account of the depletion of naval stores and material, which hitherto had made up for the deficiency of money voted by Parliament.

According to the common expression, the English Navy has been living on its own fat for the last three or four years, and if a further financial effort be not made England must submit to a diminution of her naval forces.

—*Le Temps*.

United States. *Navy Target Practice.* — The following is the official statement of the order of merit of the various vessels of the Navy, singly and in competition for the different trophies in the spring target practice. It represents the results of the work done in the short distance practice, and in comparison with similar statements in previous years makes the gratifying showing that there has been a steadily progressive improvement in the number of hits and the rapidity of fire in practically every gun crew throughout the Navy. This is the conclusion of the expert target inspectors of the Navy, who have made up these reports from year to year :—

Standing of Vessels Singly.

1. Pacific Fleet	60-386
2. Atlantic Fleet	55-286
3. Unassigned vessels	32-579

Standing of Vessels Singly.

(Star ships are those that attained at least eighty-five per cent. of the final merit of the trophy winners of their respective classes.)

United States.

Vessels Competing for the Battle-ship Trophy.

1. Maryland†	76-470	12. West Virginia	54-539
2. Illinois*	73-571	13. Rhode Island	54-317
3. Kentucky*	71-292	14. Washington	53-020
4. Virginia*	70-257	15. Kearsarge	52-943
5. Louisiana*	68-312	16. New Jersey	52-524
6. Alabama*	66-724	17. Georgia	48-811
7. Connecticut*	66-029	18. Kansas	48-406
8. Tennessee*	65-955	19. Missouri	46-957
9. Vermont	64-663	20. Maine	39-272
10. Minnesota	61-723	21. Ohio	33-926
11. Pennsylvania	56-890		

Vessels Competing for the Cruiser Trophy.

1. Albany†	76-924	7. Galveston	54-576
2. St. Louis*	69-914	8. Concord	52-048
3. Charleston*	67-966	9. Milwaukee	49-380
4. Yorktown	64-272	10. Denver	47-450
5. Chattanooga	62-317	11. Cleveland	39-935
6. Colorado	56-320	12. Des Moines	24-564

Vessels Competing for the Gun-boat Trophy.

1. Wilmington†	67-487	5. Dolphin	42-575
2. Yankton*	59-590	6. Dubuque	41-028
3. Mayflower	55-337	7. Marietta	22-820
4. Paducah	45-286	8. Scorpion	16-350

Vessels Competing for the Torpedo Trophy.

1. Perry†	68-648	7. Whipple	22-666
2. Truxtun	44-510	8. Stewart	22-125
3. Tingey	38-070	9. De Long	20-542
4. Porter	34-216	10. Thornton	10-138
5. Lawrence	32-058	11. Hull	10-066
6. Blakely	26-640		

Below will be found the standing of squadrons and divisions, and also the standing of torpedo vessels for the torpedo trophy, as shown by G.O. 67, issued by the Navy Department, under the date of 28th May, 1908 :—

Standing of Squadrons.

1. Second Squadron, Pacific Fleet: *St. Louis, Charleston, Milwaukee, Albany, Yorktown*, final merit, 64-465.
2. First Squadron, Pacific Fleet: *Maryland, Pennsylvania, West Virginia, Colorado, Tennessee, Washington*, 60-577.
3. First Squadron, Atlantic Fleet: *Louisiana, Connecticut, Vermont, Kansas, Virginia, Rhode Island, New Jersey, Georgia*, 59-169.
4. Second Squadron, Atlantic Fleet: *Minnesota, Missouri, Maine, Ohio, Illinois, Kentucky, Alabama, Kearsarge*, 55-801.

†Trophy winner; *Star ship.

United States. 5. Third Squadron, Pacific Fleet: *Chattanooga, Galveston, Denver, Cleveland, Concord, Wilmington*, 53-959.

Standing of Divisions.

1. Fourth Division, Pacific Fleet: *Albany, Yorktown*, final merit, 70-598.
2. Fourth Division, Atlantic Fleet: *Illinois, Kentucky, Alabama, Kearsarge*, 66-153.
3. Third Division, Pacific Fleet: *St. Louis, Charleston, Milwaukee*, 62-420.
4. First Division, Atlantic Fleet: *Louisiana, Connecticut, Vermont, Kansas*, 61-850.
5. First Division, Pacific Fleet: *Maryland, Pennsylvania, West Virginia, Colorado*, 61-122.
6. Second Division, Third Squadron, Pacific Fleet: *Concord, Wilmington*, 59-768.
7. Second Division, Pacific Fleet: *Tennessee, Washington*, 59-488.
8. Second Division, Atlantic Fleet: *Virginia, Rhode Island, New Jersey, Georgia*, 56-477.
9. First Division, Third Squadron, Pacific Fleet: *Chattanooga, Galveston, Denver, Cleveland*, 51-070.
10. Third Division, Atlantic Fleet: *Minnesota, Missouri, Maine, Ohio*, 45-470.

Standing of Torpedo Flotillas.

1. Fourth Flotilla: *Perry*, final merit, 68-648.
2. Second Flotilla: *Truxtun, Lawrence, Whipple, Stewart, Hull*, 26-285.
3. Third Flotilla: *Tingey, Porter, Blakely, De Long, Thornton*, 26-921.

Vessels Competing for the Torpedo Trophy.

(Guns and Torpedoes Both Counted.)

1, *Perry*, trophy-winner, 68-648; 2, *Truxtun*, 44-510; 3, *Tingey*, 38-070; 4, *Porter*, 34-216; 5, *Lawrence*, 32-058; 6, *Blakely*, 26-840; 7, *Whipple*, 22-666; 8, *Stewart*, 22-125; 9, *De Long*, 20-542; 10, *Thornton*, 10-138; 11, *Hull*, 10-066.

(Guns only Counted.)

1, *Perry*, 68-648; 2, *Preble*, 63-753; 3, *Truxtun*, 47-383; 4, *Lawrence*, 33-613; 5, *Tingey*, 32-642; 6, *Stewart*, 29-158; 7, *Whipple*, 25-201; 8, *Hull*, 19-013; 9, *Porter*, 15-849; 10, *Blakely*, 14-717; 11, *Thornton*, 12-254; 12, *De Long*, 2-642.

(Torpedoes only Counted.)

1, *Perry*, 68-648; 2, *Truxtun*, 41-279; 3, *Tingey*, 39-423; 4, *Porter*, 38-808; 5, *Lawrence*, 30-697; 6, *Blakely*, 29-621; 7, *De Long*, 25-018; 8, *Hopkins*, 22-065; 9, *Whipple*, 19-814; 10, *Stewart*, 15-086; 11, *Thornton*, 9-607; 12, *Hull*, 00-000.

V. H. METCALF, *Secretary.*

—*Army & Navy Journal.*

United States. *Report of Bureau of Equipment, U.S.N.* — Rear-Admiral William S. Cowles, U.S.N., Chief of the Bureau of Equipment of the Navy Department, in his annual report submits the following estimates for the Bureau for the fiscal year ending 30th June, 1909: Equipment of vessels, 4,250,000 dollars, as against 3,250,000 dollars last year; chain making machines, 100,000 dollars; equipment machinery plants, 150,000 dollars; coal and transportation, 5,000,000 dollars, as against 4,150,000 dollars last year; contingent, 15,000 dollars; ocean and lake surveys, 75,000 dollars; depôts for coal, 600,000 dollars; increase in Navy equipment, 400,000 dollars; as against 500,000 dollars last year; civil establishment, 46,978 dollars, as against 38,028 dollars last year; salaries, 37,320 dollars, as against 26,040 dollars last year.

The coal depôts and coaling plants under the supervision of the Bureau, together with their capacities, are as follows: Frenchman Bay, Me., 10,000 tons; naval station, Portsmouth, N.H., 10,000 tons; naval station, Boston, Mass., 12,800 tons; Narragansett Bay, 40,000 tons; naval station, New London, Conn., 11,300 tons; naval station, New York, 9,000 tons; naval station, League Island, Pa., 15,000 tons; naval station, Washington, D.C., 3,000 tons; naval station, Key West, Fla., 15,000 tons; naval station, New Orleans, 5,000 tons; Sitka, Alaska, 5,000 tons; naval station, Puget Sound, 22,900 tons; naval station, Mare Island, California, 20,000 tons; naval station, Culebra, W.I., 5,000 tons; naval station, Hawaii, 30,000 tons; naval station, Tutuila, Samoa, 5,000 tons; naval station, Island of Guam, 3,000 tons; naval station, Cavite, P.I., 7,200 tons; Olongapo, P.I., 10,000 tons. The necessity for modern naval coal depôts of large capacity, economically administered, becomes more evident each year. The experience of the bureau shows that in order to get the best coal for the Navy it must be purchased when it is available. The price of handling coal at depôts where modern machinery is not installed is from 30 to 60 cents a ton each way, whereas at a depôt like Bradford coal can be handled into storage for about six cents a ton, with eight or ten cents a ton additional for trimming, and out of storage for five and one-half cents.

Admiral Cowles points out that the expenditures for "coal and transportation" during the present fiscal year 1908, have been increased by the necessity for transporting large quantities of coal great distances to meet the exigencies due to the movement of the entire fleet of the United States to the waters of the Pacific. To recapitulate in brief the reasons for increase in cost of purchasing, transporting, and handling coal for the United States Navy since 1902, and for requiring an increased appropriation under "coal and transportation" for the fiscal year, 1909: (a) Increase in the number of purposes to which the appropriation is applied. (b) Increase in the number of ships in commission. (c) Increase in size of ships and consequent coal consumption. (d) Increase in first cost of coal at tide water. (e) Increase in freight rates due to diminution of American shipping, which destroys competition. (f) Increase in freight rates due to transporting coal to greater distances than heretofore, because of the fleet going farther abroad.

United States.

During the year there were purchased and distilled 115,404,730 gallons of water at an average cost of forty-five and seven-tenths cents per 1,000 gallons. The sum of 49,183.20 dollars was spent for pilotage for ships of war, 4,242.77 dollars for towage, and 45,545.12 dollars for canal tolls. The sum of 499,800.10 was spent for alterations, additions, and repairs to vessels and for the manufacture of electrical supplies. It is recommended that junior officers be detailed as assistant inspectors at private shipyards, and that gunners be detailed as assistants in connection with the installation of electric plants.

The steam turbine having proved suitable for driving marine dynamos, turbo-generators are ordered for the new battleships, the largest unit contemplated so far being 300 kilowatts. The Bureau is co-operating with the Bureau of Ordnance in perfecting the fire-control installation of the fleets. Sample gold-plated metallic searchlight mirrors have been purchased from France and are under test, with a view to determining their relative merits with the silver-plated glass mirror in normal and hazy or foggy weather. Electric heating and cooking devices are to be investigated, and it is believed that they may be used in a limited way to advantage on board ship. Electrically driven dish-washing, meat-chopping, dough-mixing, and potato-peeling machines have been installed or are being installed on all the larger vessels.

During the year experiments were made with wireless direction finders, and these will be continued during the coming year. Arrangements have been made for testing wireless telephones for use in connection with the work of the fleet, though even if successful, as is expected, the wireless telephone will not replace the telegraph, but will rather be used in conjunction with it. Changes in apparatus have been made in many stations, both on shore and on board ship. The state of the art is such that constant attention must be paid to wireless apparatus in order to keep pace with current development and maintain the stations in the highest state of efficiency. From figures presented, it appears that, excluding installations on foreign vessels, the United States has in operation more than half of all the wireless telegraph installations in the world. Seventy-three American naval vessels are thus equipped. Figures as to foreign naval ships are not available.—*Army and Navy Journal*.