Dawn of the Battleship

Evolution of the Battleship 1889-1910

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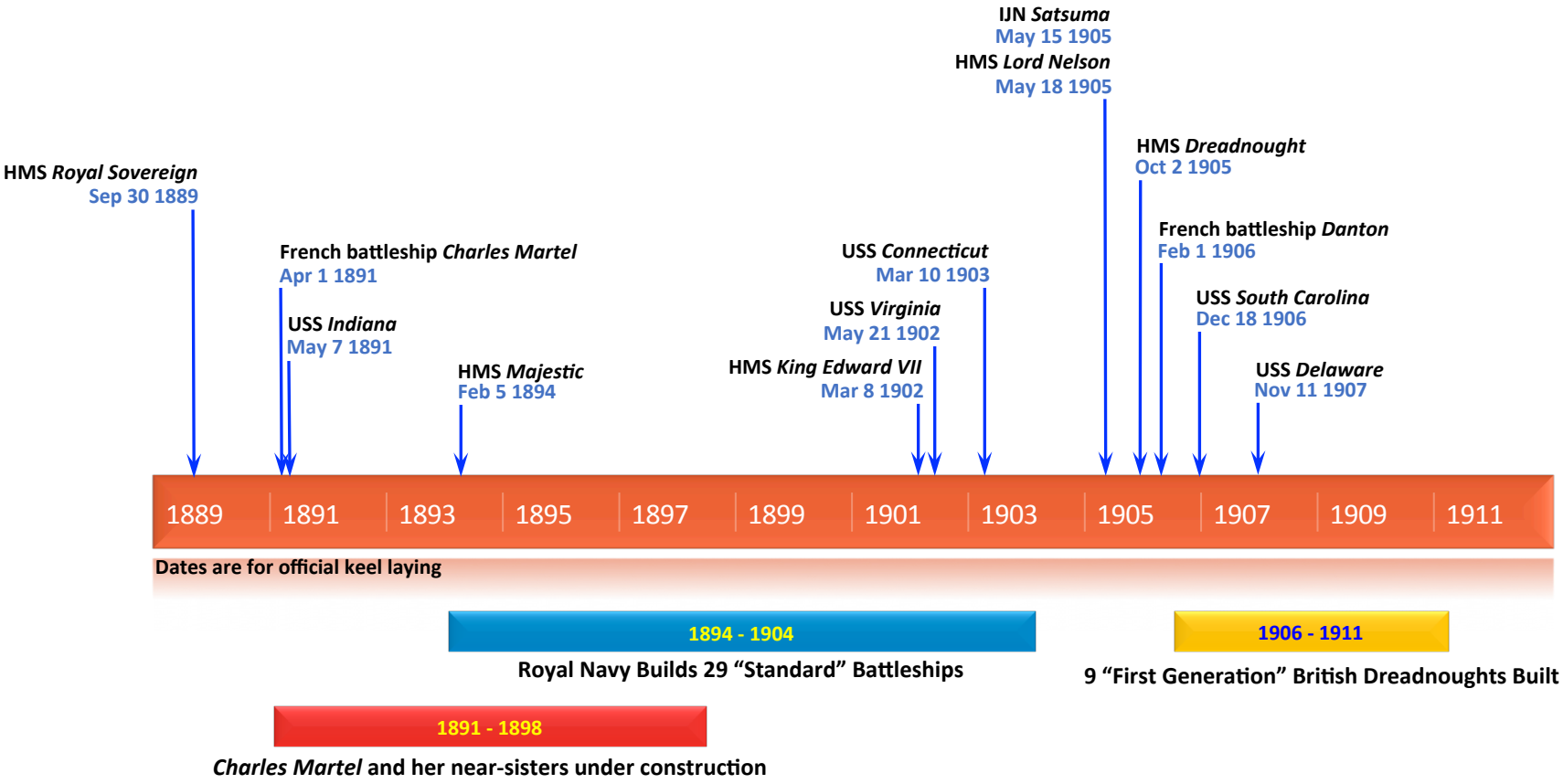
Admiralty Trilogy Seminar

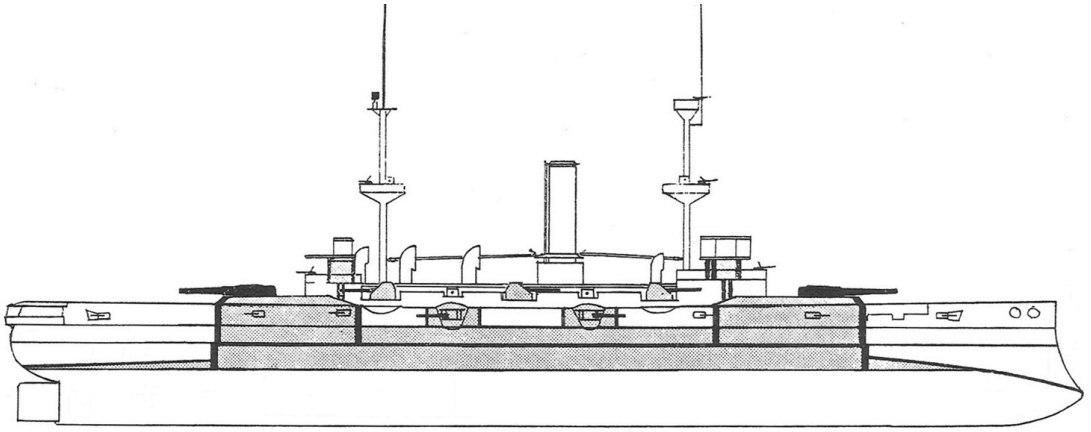
Introduction

- "Battleship" a heavy warship with extensive armor and large caliber guns
- The word "battleship"
  - Derived from the phrase "line of battle ship"
  - Came into common usage around 1887
  - Adopted officially by the Royal Navy between 1889 - 1892
- Baseline naval technology in 1889
  - Guns: Breech loading, short barrels, low muzzle velocity, slow firing
  - Armor: Compound — High carbon steel front plate backed by elastic low-carbon iron
  - Engines: Vertical triple expansion, Cylindrical boilers

Battleship Development Timeline



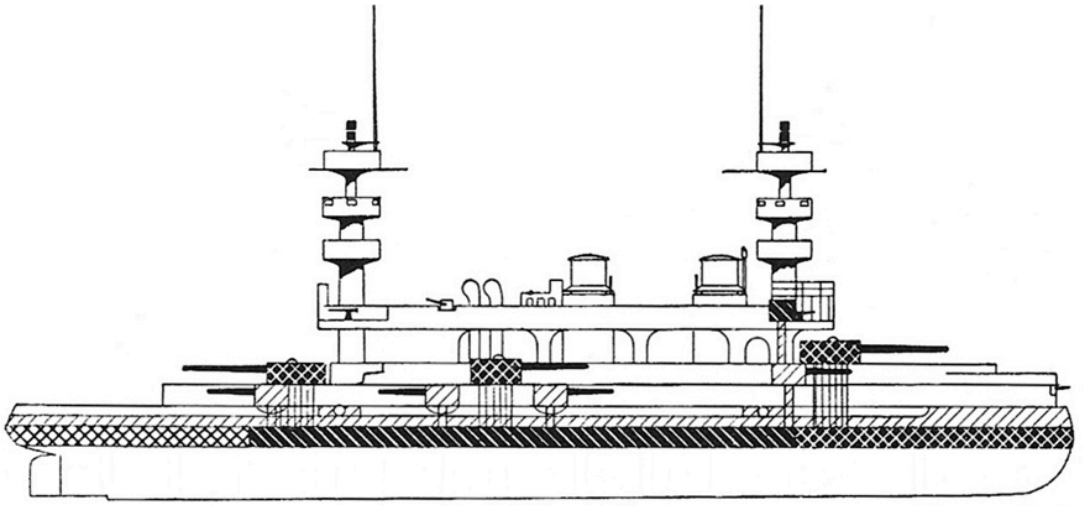
In The Beginning



- **HMS *Royal Sovereign***
  - **Type: Pre-Dreadnought**
  - **Laid Down: Sep 20, 1889**
  - **Displacement: 14, 150 tons**
  - **Main guns fore and aft in open barbettes**
  - **Strong secondary armament**
  - **Armament: 4 x 13.5 inch/30 Mark III, 10 x 6 inch QF Mark II, 10 x 6-pounder QF, 12 x 3-pounder QF, 6 x 18 inch torpedo tubes**
  - **Armor: Compound – Belt 14 inches, Barbettes 17 inches**
  - **Engines: 2 shafts, Vertical triple expansion – IHP 9,000 = 15.7 knots (normal draft); IHP 11,000 = 17.5 knots (forced draft)**

HMS *Royal Sovereign*

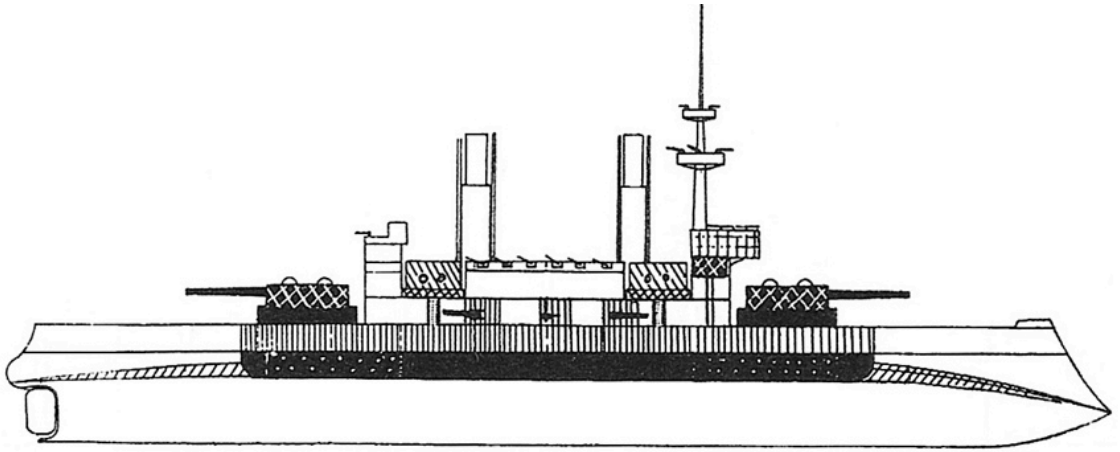
The French Response



- *Charles Martel*
  - **Type: Pre-Dreadnought**
  - **Laid Down: Apr 1, 1891**
  - **Displacement: 11,693 tons**
  - **Main guns in turrets, Lozenge distribution**
  - **Intermediate battery in turrets**
  - **Tumblehome hull**
  - **Armament: 2 x 305mm/45 M1887, 2 x 274mm/45 M1887, 8 x 138mm/45 M1888, 4 x 9-pounder QF, 12 x 3-pounder QF, 8 x 1-pounder revolvers, 2 x 450mm torpedo tubes**
  - **Armor: Compound – Belt 17.7 inches, Turrets 15 inches**
  - **Engines: 2 shafts, Vertical triple expansion – IHP 14,900 = 18 knots**

Charles Martel

The American Way

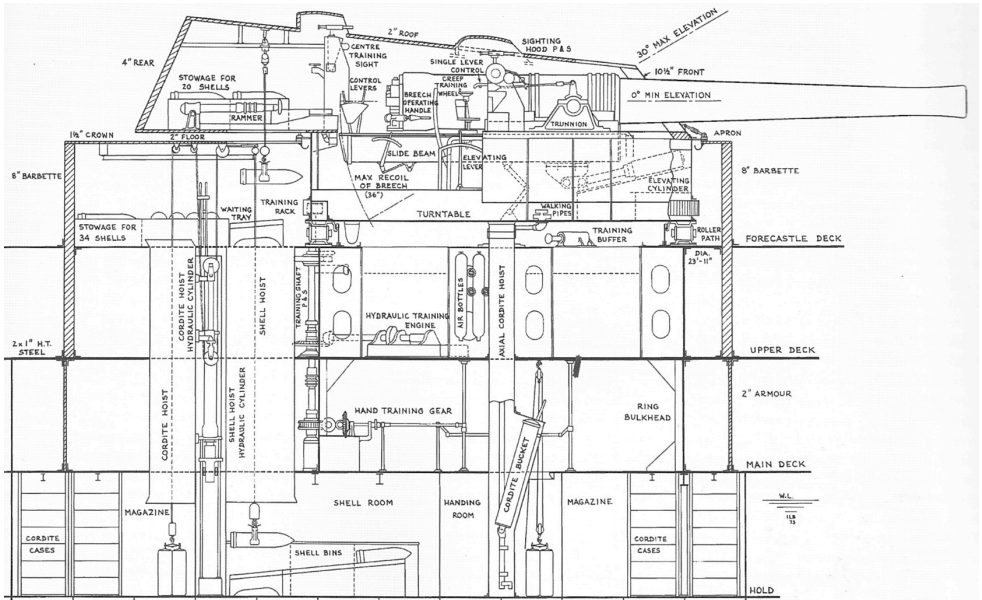


- **USS *Indiana* (BB-1)**
  - **Type: Pre-Dreadnought**
  - **Laid Down: May 7, 1891**
  - **Displacement: 10,288 tons**
  - **First real American battleship**
  - **Main and intermediate battery in turrets**
  - **Armament: 4 x 13 inch/35 Mark 1, 8 x 8 inch/35 Mark 3, 4 x 6 inch/ 40 Mark 4, 20 x 6-pounder QF, 6 x 1-pounder QF, 4 x 18-inch torpedo tubes**
  - **Armor: Harvey & Nickel Steel – Belt 18 inches, Turret 15 inches**
  - **Engines: 2 shafts, Vertical triple expansion IHP 9000 = 15 knots**

USS *Indiana*

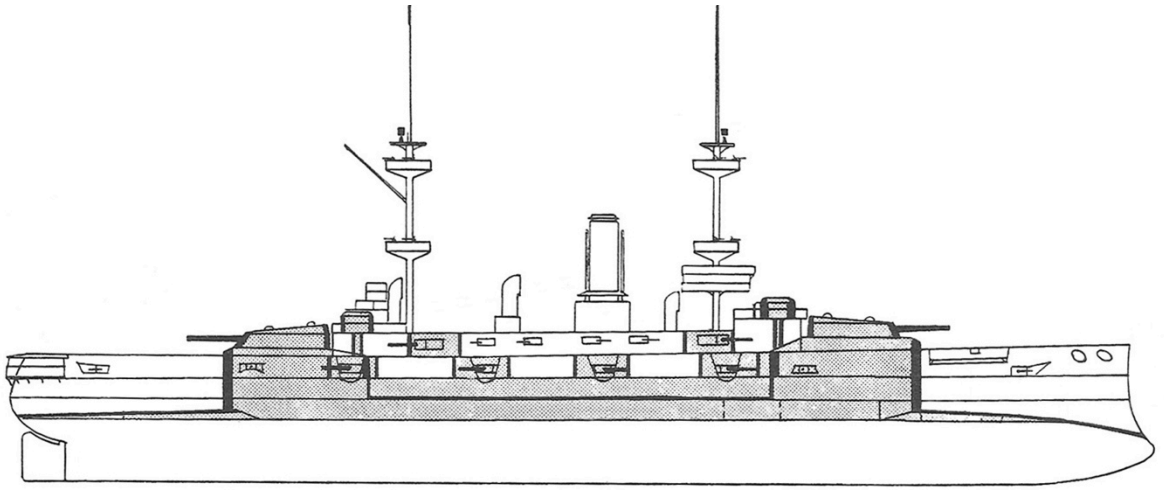
The "Standard" Battleship

- **Standard battleship design concept**
  - **Fully armored gunhouses protecting main guns**
  - **Quick firing secondary battery in casemates**
  - **Harvey armor plate for more complete protection**
  - **Largest class of battleships ever built for the Royal Navy – 9 hulls**
  - **Established the pattern for 20 additional British battleships built to this design concept from 1899 to 1904**



MkVIII 12in/35 Gun (Friedman)

HMS *Majestic*

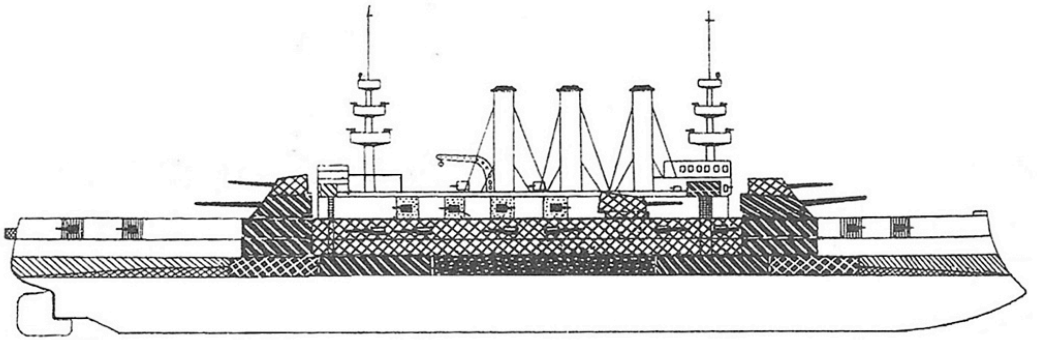


- ***Majestic* Class details**
  - **Type: Pre-Dreadnought**
  - **Laid Down: Feb 5, 1894**
  - **Displacement: 14,900 tons**
  - **Armament: 4 x 12 inch/35 Mark VIII, 12 x 6 inch/40 QF Mark III, 16 x 12-pounder QF, 12 x 3-pounder QF, 5 x 18 inch torpedo tubes.**
  - **Armor: Harvey – Belt 9 inches, Turrets 10 inches**
  - **Engines: 2 shafts, Vertical triple expansion – IHP 10,000 = 16 knots (natural draft), IHP 12,000 = 17.5 knots (forced draft)**

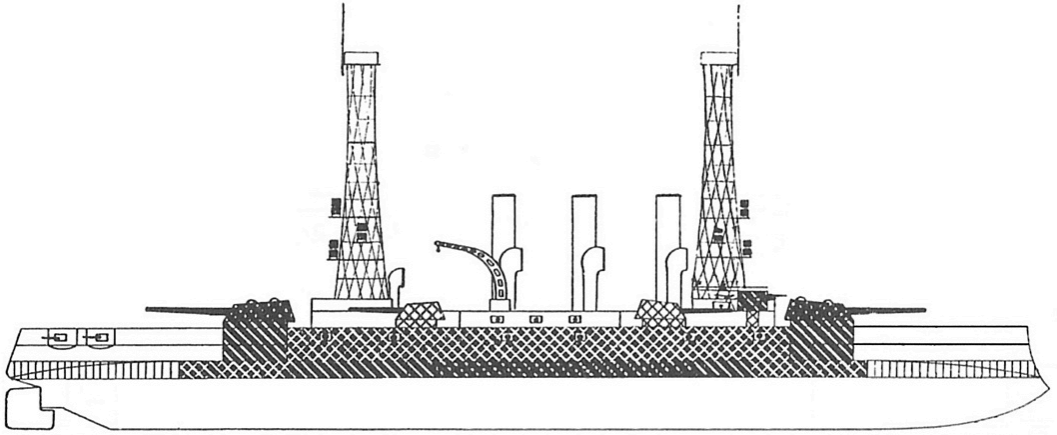
HMS *Majestic*

http://www.viewing.com/Mars/HMS%20Mars.html

Guns and More Guns



- USS *Virginia* (BB-13)
  - Type: Pre-Dreadnought
  - Laid Down: May 21, 1902
  - Two superposed turrets – bad idea
  - Combined strong intermediate and secondary batteries



- USS *Connecticut* (BB-18)
  - Type: Pre-Dreadnought
  - Laid Down: Mar 10, 1903
  - Reverted to wing turrets for intermediate battery
  - 7-inch secondary guns for additional firepower
- Drove abandonment of the "standard" battleship

US Battleships Details

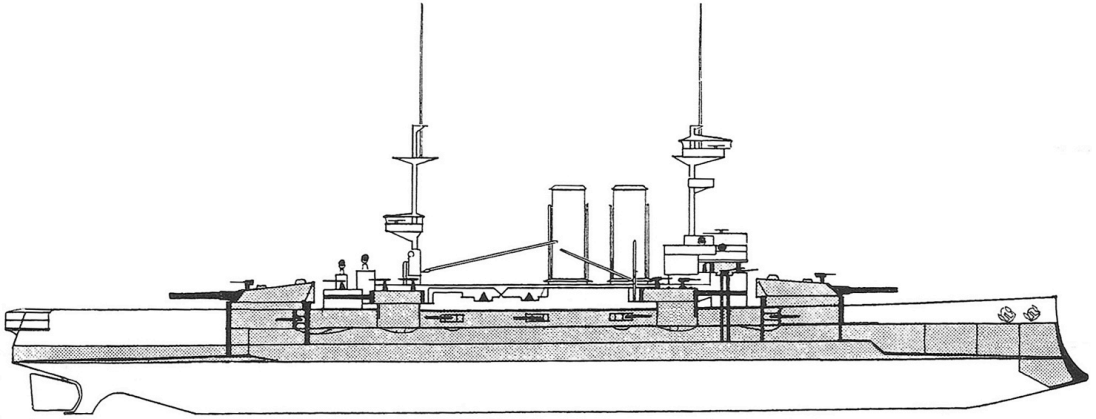
- **USS *Virginia* (BB-13)**
  - **Displacement: 14,948 tons**
  - **Armament: 4 x 12 inch/40 Mark 4, 8 x 8 inch/45 Mark 6, 12 x 6 inch/ 50 QF Mark 6, 12 x 3 inch QF, 4 x 21 inch torpedo tubes**
  - **Armor: Krupp Cemented – Belt 11 inches, Turrets 11 inches**
  - **Engines: 2 shafts, Vertical triple expansion – IHP 25,463 = 19 knots**

- **USS *Connecticut* (BB-16)**
  - **Displacement: 16,000 tons**
  - **Armament: 4x 12 inch/45 Mark 5, 8 x 8 inch/45 Mark 6, 12 x 7 inch/ 45 QF Mark 1, 20 x 3 inch/50 QF. 4 x 21 inch torpedo tubes**
  - **Armor: Krupp Cemented – Belt 11 inches, Turrets 11 inches**
  - **Engines: 2 shafts, Vertical triple expansion – IHP 16,500 = 18 knots**

USS *Virginia*

USS *Connecticut*

The British Response

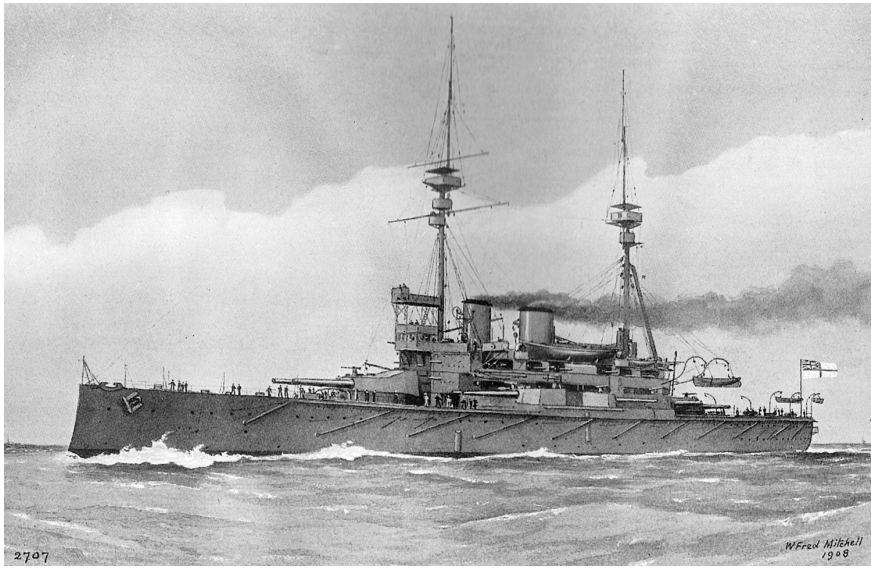


- **HMS *King Edward VII***
  - **Type: Pre-Dreadnought**
  - **Laid Down: Mar 8, 1902**
  - **Displacement: 16,350 tons**
  - **Last class of British Pre-Dreadnoughts**
  - **Intermediate battery of 9.2 inch guns**
  - **Japanese *Kashima* class very similar**
  - **Armament: 4 x 12 inch/40 Mark IX, 4 x 9.2 inch/45 Mark X, 12 x 6 inch QF Mark VII, 14 x 12-pounder QF, 6 x 18 inch torpedo tubes**
  - **Armor: Krupp Cemented – Belt 9 inches, Turrets 12 inches**
  - **Engines: 2 shafts, Vertical triple expansion – IHP 18,000 = 18 knots**

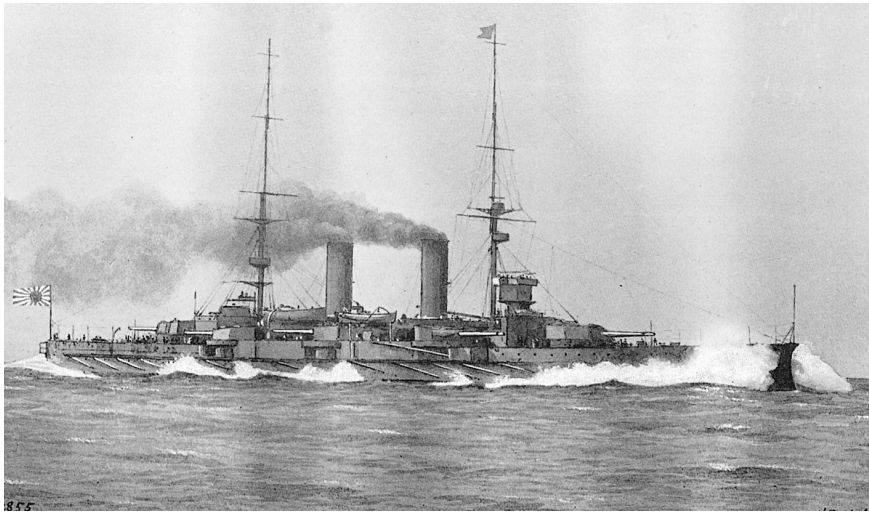
HMS *King Edward VII*

The Semi-Dreadnoughts

- Combine a powerful intermediate battery with large caliber main guns fore and aft
- No smaller secondary guns, just anti-torpedo guns
  - Japan's *Aki* is an exception, she retained 6-inch secondary battery
- The British built the two *Lord Nelson* class, completed in 1908
- The Japanese built two *Satsuma* class, completed in 1911
- The French built six *Danton* class, turbine-driven and not completed until 1911

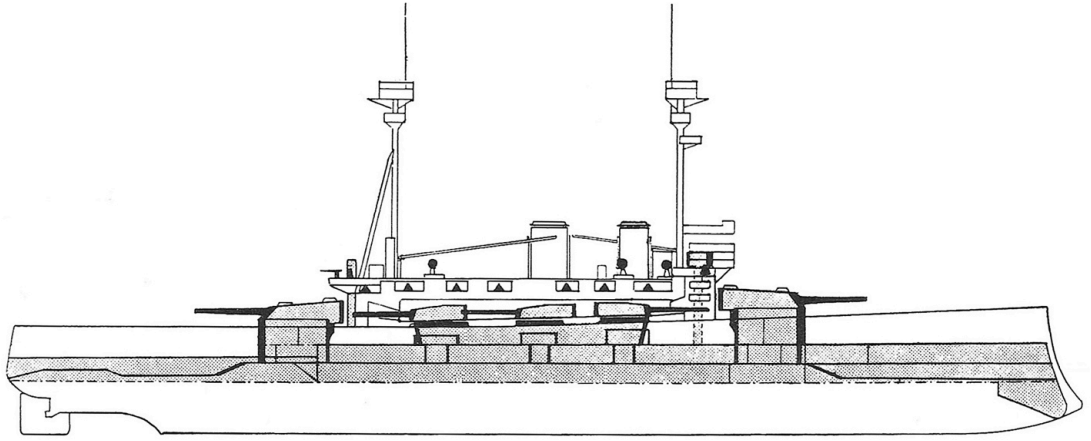


HMS *Lord Nelson*, Brassey's Naval Annual 1908



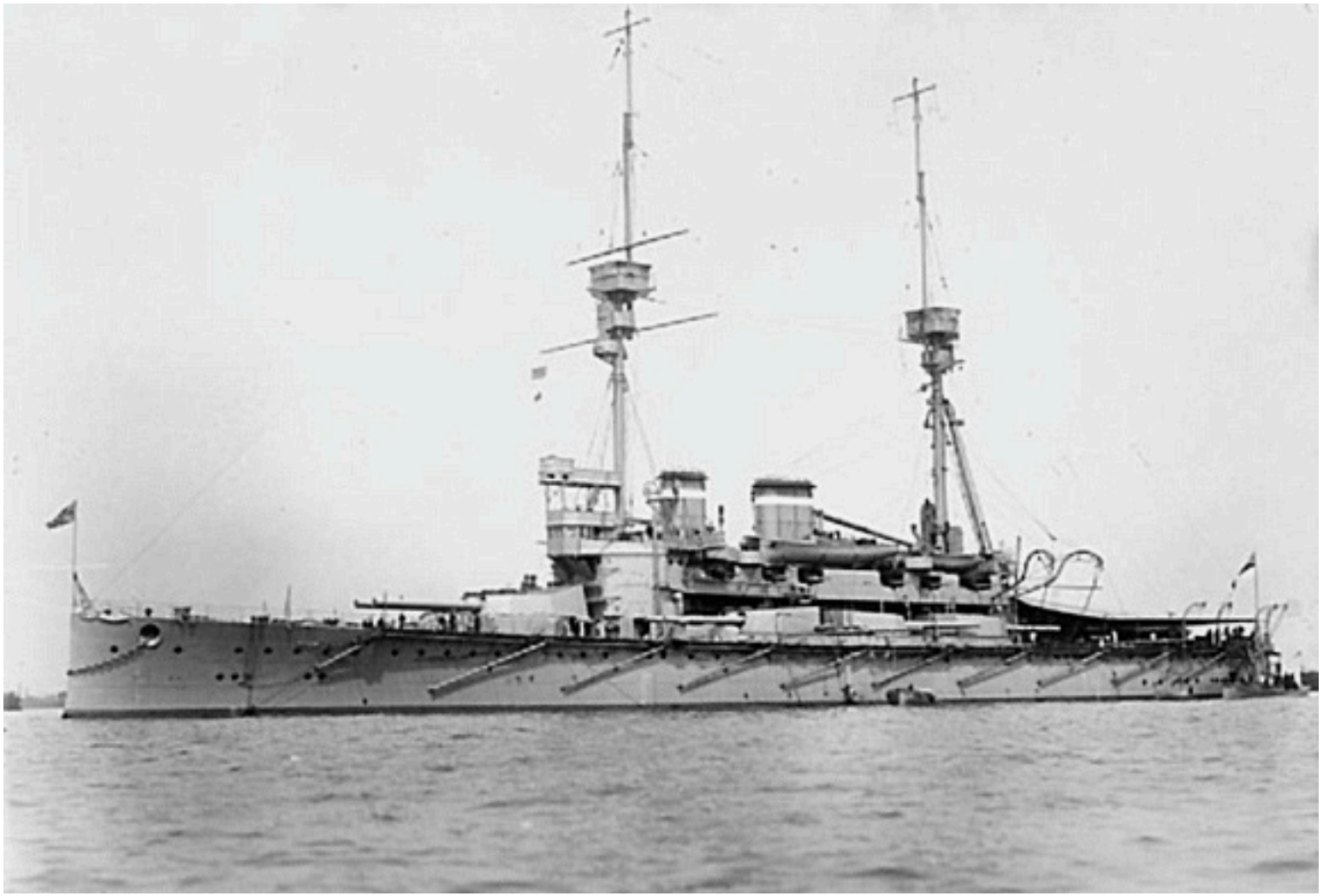
IJN *Satsuma*, Brassey's Naval Annual 1910

Semi-Dreadnought Details

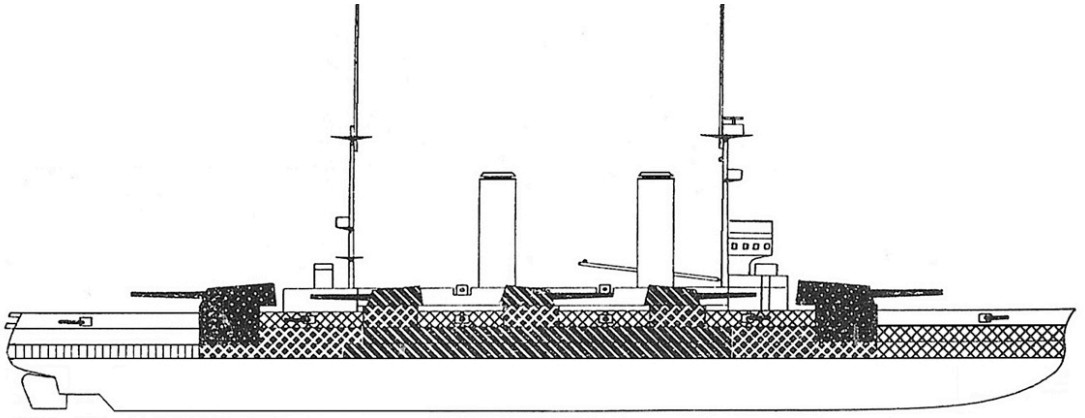


- **HMS *Lord Nelson***
  - **Laid Down: May 18, 1905**
  - **Displacement: 16,500 tons**
  - **Armament: 4 x 12 inch/45 Mark X, 10 x 9.2 inch/45 Mark XI, 24 x 12-pounder QF, 5 x 18 inch torpedo tubes**
  - **Armor: Krupp Cemented – Belt 12 inches, Turrets 12 inches**
  - **Engines: 2 shafts, Vertical triple expansion – IHP 16,750 = 18 knots**

HMS *Lord Nelson*



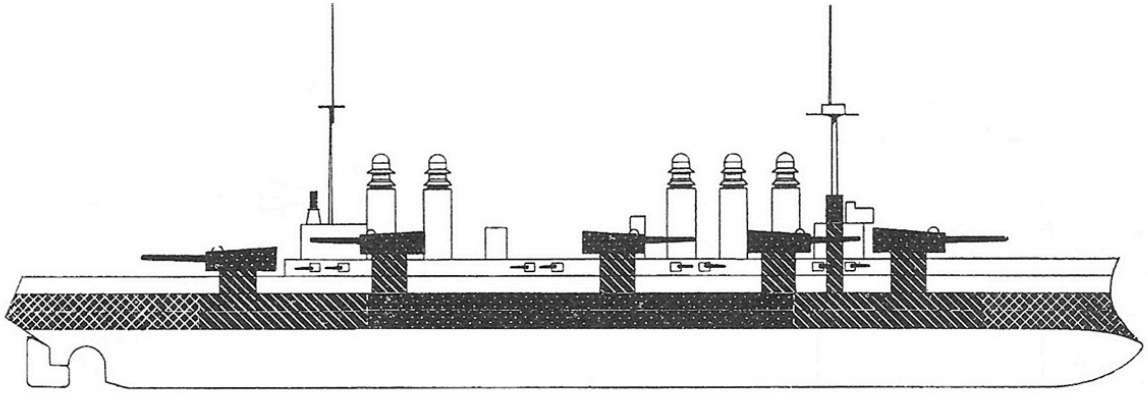
Semi-Dreadnought Details



- **IJN *Satsuma***
  - **Laid Down: May 15, 1905/Mar 3, 1906**
  - **Displacement: 19,370/19,800 tons**
  - ***Satsuma* Armament: 4 x 12 inch/45 Type 41, 12 x 10 inch/45 Type 41, 12 x 4.7 inch Type 41 QF, 8 x 3 inch QF, 5 x 18 inch torpedo tubes**
  - ***Aki* Armament: 4 x 12 inch/45 Type 41, 12 x 10 inch/45 Type 41, 8 x 6 inch/40 Type 41 QF, 8 x 3 inch QF, 5 x 18 inch torpedo tubes**
  - **Armor: Krupp Cemented – Belt 9 inches, Turrets 8 inches**
  - **Engines: 2 shafts, Vertical triple expansion**
    - ***Satsuma*: IHP 17,300 = 18 knots**
    - ***Aki*: IHP 25,000 = 20 knots**

IJN *Satsuma*

Semi-Dreadnought Details



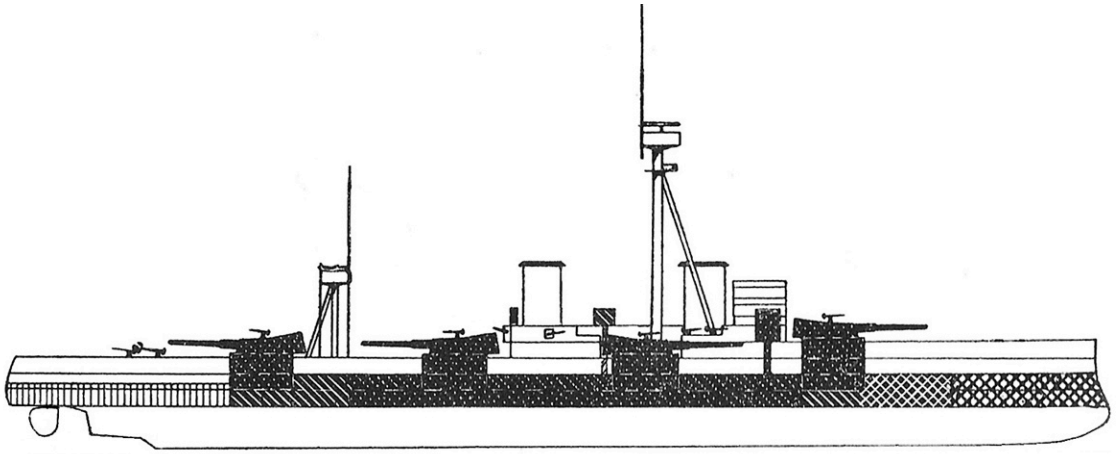
- *Danton*
  - Laid Down: Feb 1, 1906
  - Displacement: 18,400 tons
  - Armament: 4 x 305mm/45 M1906, 12 x 240mm/50 M1902, 16 x 75mm QF M1906, 10 x 47mm QF, 2 x 450mm torpedo tubes
  - Armor: Krupp Cemented – Belt 10.8 inches, Turrets 11.8 inches
  - Engines: 4 shafts, Parsons turbines – SHP 22,500 = 19.2 knots

French Battleship *Danton*

Driver of the All Big Gun Battleship

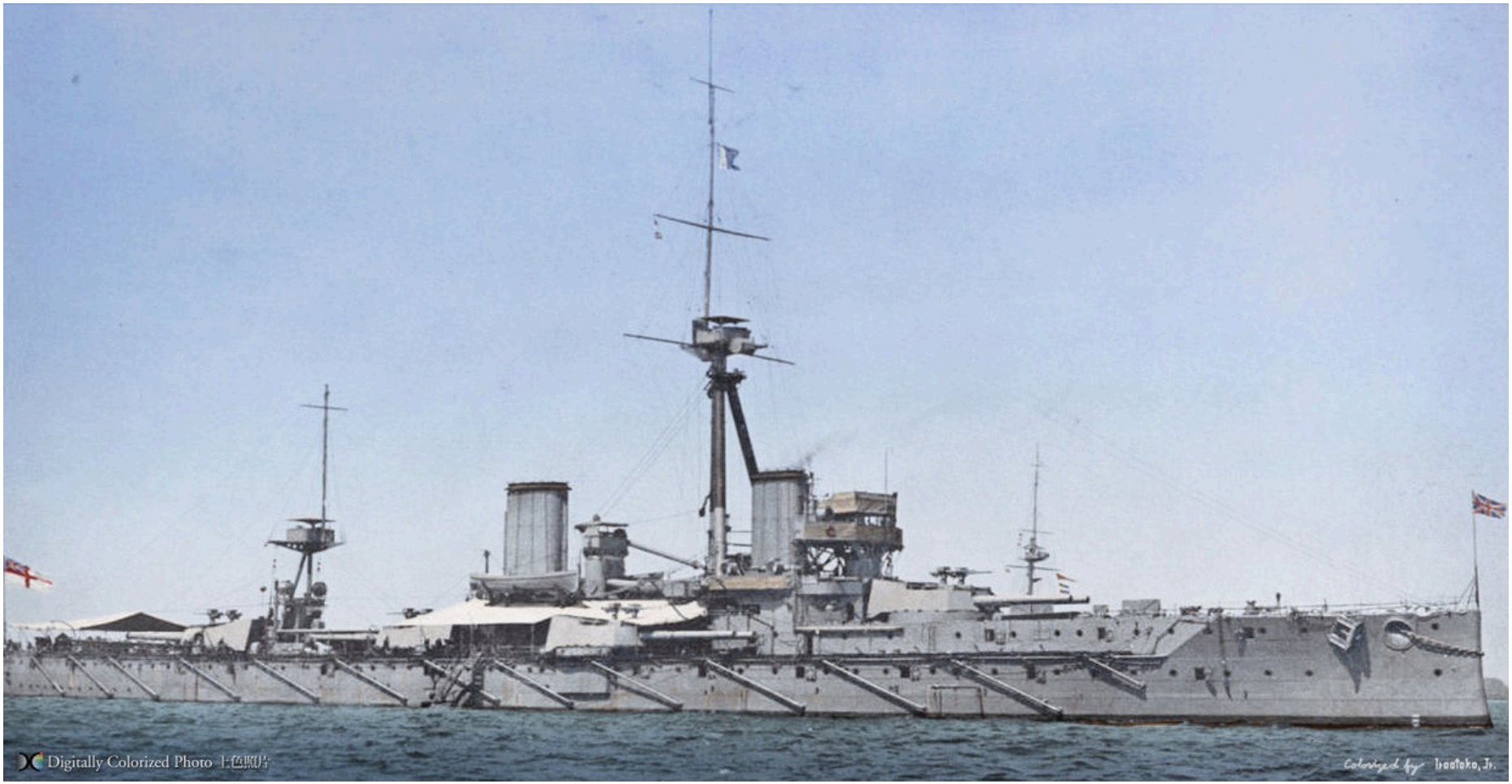
- Belief that accurate, long-range gunnery was possible and could be effective
- Enabling technologies
  - Effective optical rangefinders
  - Plotting instruments (the "Dumaresq")
  - First gunnery calculator (Vickers "range clock")
  - First data transmission systems – coordinated battery fire
  - Battle practice ranges increase from about 1,000 yards (1890s) to about 5,000 yards (1904)
- Tactical consideration—the increasing range and speed of torpedoes, a more threatening weapon
- Spanish-American War was dominated by quick firing guns, but there was no practical concept of fire control in the late 1890s
- Russo-Japanese War showed long range hitting was possible
- This all leads to….

HMS *Dreadnought*



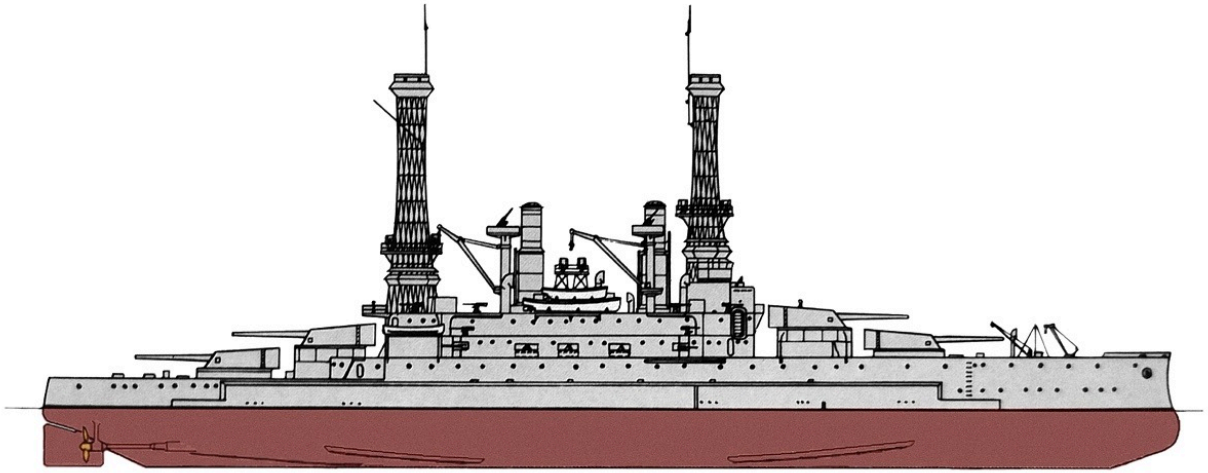
- **Laid Down: Oct 2, 1905**
- **Completed: Feb 10, 1906**
- **Displacement: 18,110 tons**
- **First all big gun battleship – namesake of the new ship type**
- **First turbine powered battleship**
- **First battleship with a “range clock”**
- **Armament: 10 x 12 inch/45 Mark X, 27 x 12-pounder QF, 5 x 18 inch torpedo tubes**
- **Armor: Krupp Cemented – Belt 11 inches, Turrets 8 inches**
- **Engines: 4 shafts, Parsons turbines – SHP 23,000 = 21 knots**

HMS *Dreadnought*



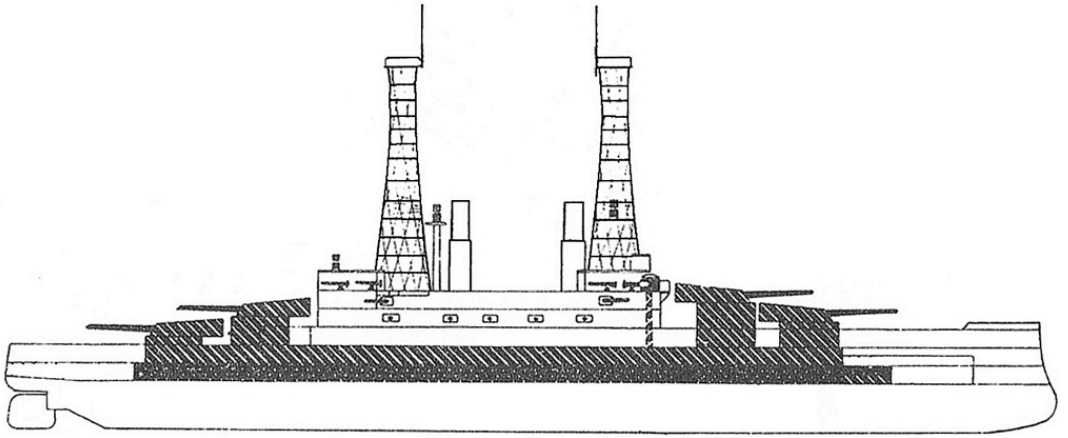
USS *South Carolina* (BB-26)

- Congressionally limited size forced the adoption of the all-centerline gun disposition
- The U.S. Navy always considered these ships pre-dreadnoughts and operated them in a squadron with the *Connecticut* class
- But the all-centerline gun arrangement has plenty of room for further development



http://militaryhistory.x10.mx/shippictures/south%20carolina.htm

USS *South Carolina* - Details



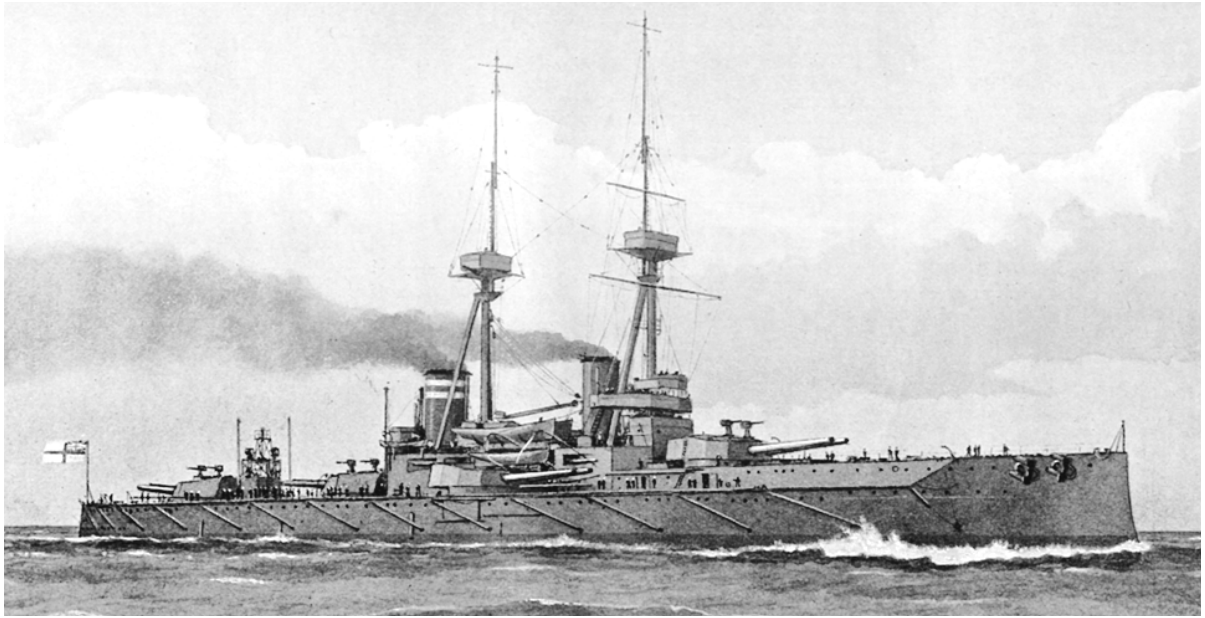
- **Laid Down: Oct 18, 1906**
- **Displacement: 16,000 tons**
- **Armament: 8 x 12 inch/45 Mark 5, 22 x 3 inch/50 QF, 2 x 21 inch torpedo tubes**
- **Armor: Krupp Cemented – Belt 12 inches, Turrets 12 inches**
- **Engines: 2 shafts, Vertical triple expansion – IHP 16,500 = 18 knots**

USS *South Carolina*

The British Tread Water

- Six ships similar to *Dreadnought* are built (*Bellerophon* class 1906-1909) and *St. Vincent* class (1907-1910) to quickly build up the Royal Navy's dreadnought fleet

- A modified design to give a ten-gun broadside produced HMS *Neptune* (1909-1911) and the very similar *Colossus* class (1909-1911) of two ships



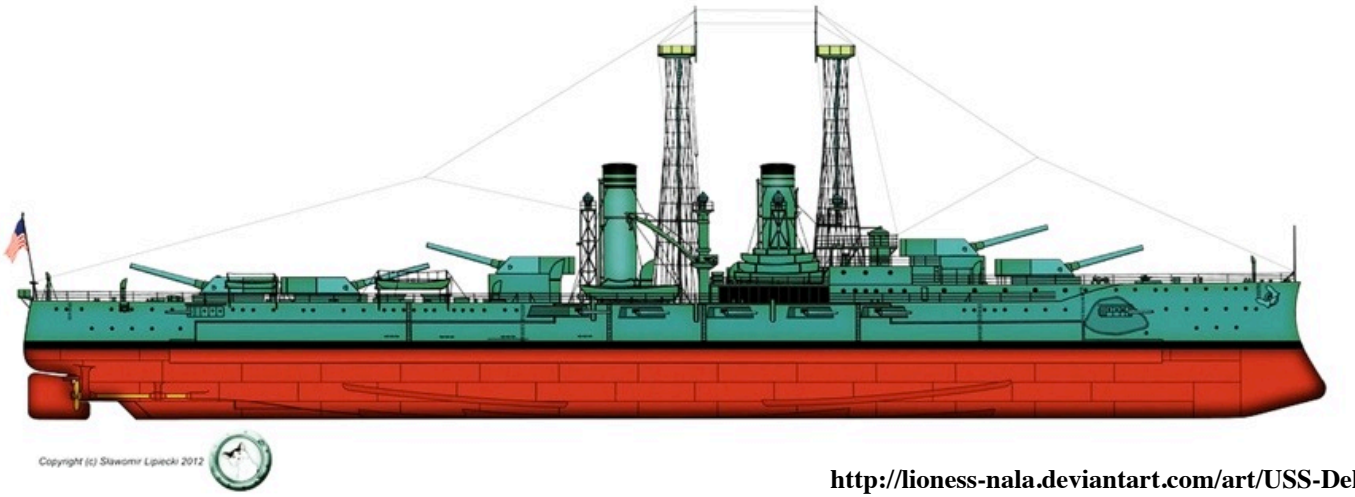
HMS *St Vincent*
Brassey's Naval Annual 1910

HMS *Superb*

(*Bellerophon* Class)

USS *Delaware* (BB-28)

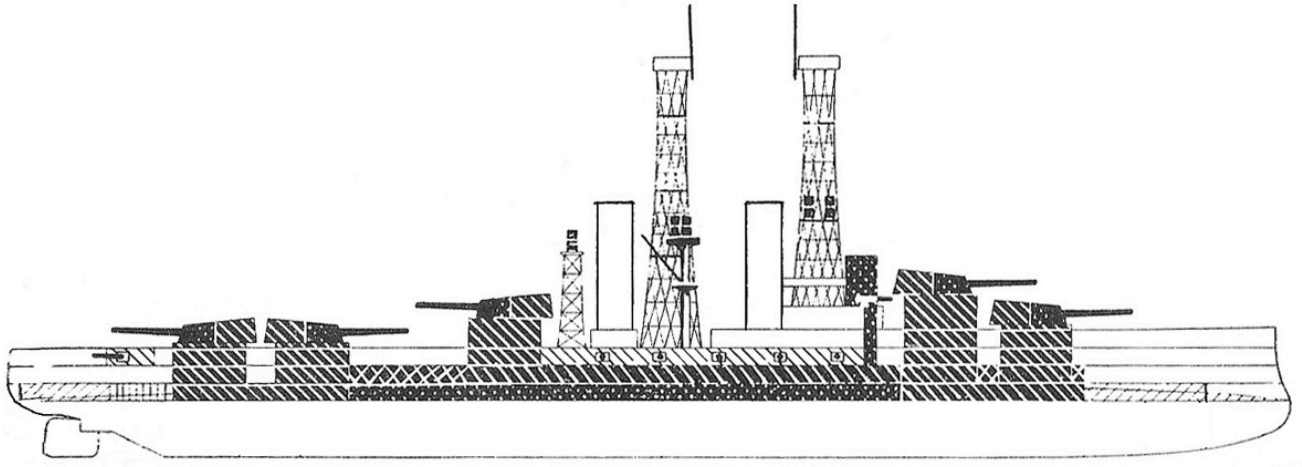
- **Built 1907-1910 (commissioned only a month after *South Carolina*)**
- **Five twin turrets, all centerline armament, gives a powerful broadside**
- **Effective (five-inch) anti-torpedo boat battery**
- ***Delaware* class set the standard for all future dreadnought and super-dreadnought battleships**



http://lioness-nala.deviantart.com/art/USS-Delaware-1911-339874185

USS *Delaware* - Details

- **Laid Down: Nov 11, 1907**
- **Displacement: 20,380 tons**
- **Armament: 10 x 12 inch/45 Mark 5, 14 x 5 inch/50 QF Mark 5, 2 x 21 inch torpedo tubes**
- **Armor: Krupp Cemented – Belt 11 inches, Turrets 12 inches**
- **Engines: 2 shafts, Vertical triple expansion – IHP 25,000 = 21 knots**

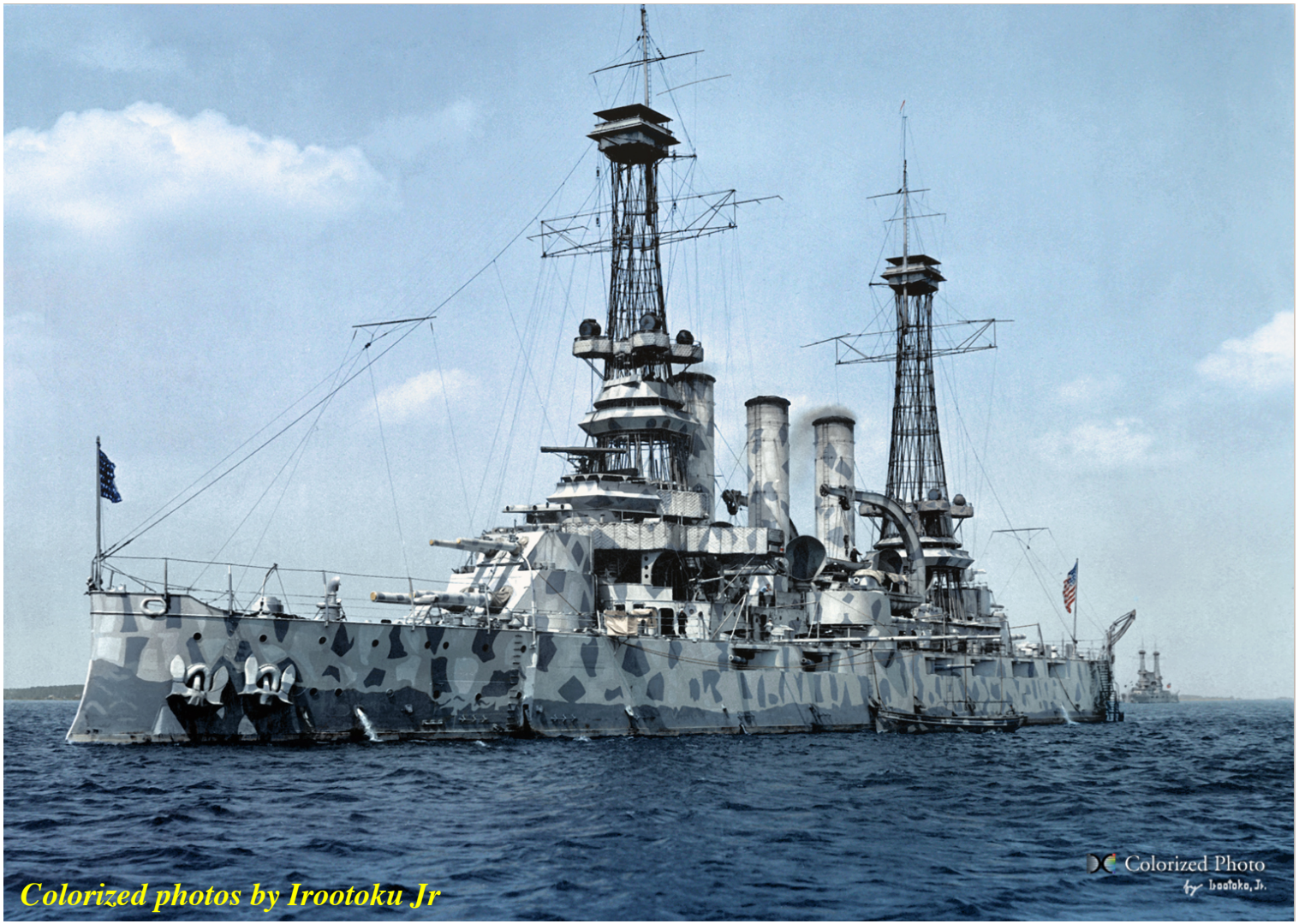


USS *Delaware*

Conclusions

- HMS *Royal Sovereign* inaugurated the pre-dreadnought era and represented the culmination of two decades of experimentation and development
- Technical and tactical developments drive improvements in battleship design
  - Guns, armor, torpedoes, and propulsion all advancing rapidly
  - Fire control technologies pushed the all big gun battleship concept
  - Increased capabilities resulted in much larger ships
- Improved battleship classes caused new developments in tactics and ship design
  - Scouting becomes even more important
  - Development of the battlecruiser
- Rapid technological advancement led to an open arms race between the great naval powers
  - Every naval power was always looking over its shoulder at what the other naval powers were doing

Questions



Colorized photos by Irootoku Jr