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OUR RECENTLY PURCHASED WARSHIPS.

It may safely be said that Armstrong's is the only shipbuilding yard in Europe where we could have purchased two cruisers whose general features so closely approximate to the distinctive features of warship design as carried out in this country.

Of late years the celebrated Armstrong firm, in the North of England, has been turning out ships which have carried truly enormous batteries compared with the displacement of the ships, and, at the same time, have shown themselves phenomenally speedy.

Our new acquisitions, the "Amazonas" and "Admiral Breyer," are the very latest product of this yard and they exhibit the characteristic qualities of good speed and abnormally heavy battery, comparing in this respect with our own "Cincinnati."

The battery, as we have said, is, for the size of the ship, very powerful. It is not only powerful in numbers, but owing to the fact that its guns are of the latest Armstrong pattern, they have vastly greater power for their size than guns that were built only four or five years ago.

COMPARISON OF TOTAL ENERGY OF FIRE DURING ONE MINUTE FROM EITHER BROADSIDE.

Table with columns: Ship Name, Number and Size of Guns, Muzzle Energy, Shots per Minute from Each Gun, Total Energy. Rows for Amazonas (1897) and Intrepid (1892).

* This rapidity of fire would not of course be maintained for any length of time in the excitement and slaughter of a modern sea fight.

From this comparison then it is evident that although the two ships are of the same size, the "Amazonas" can deliver from her broadside more than double

the energy of shell fire that the "Intrepid" can, although the latter ship was built only five years in advance of the former—such is the rapidity with which naval science and construction advances.

Foot-ton energy, which we have chosen as the basis of comparison, is the product of weight or mass by velocity; and as the weight of the shells for each caliber of gun is the same, the increase in energy is due to the very high velocities of the "Amazonas" guns as compared with those of the "Intrepid."

As further illustrating the development in naval design in a brief five years, we append a further comparison:

Table with columns: Ship Name, Thickness of Deck, Horse Power, Speed, Coal Capacity. Rows for Amazonas and Intrepid.

We find then that by the use of improved materials and methods the naval architect has been able, using the same capital (3,600 tons displacement), to produce a ship having superiority on every point of comparison—a ship with more speed, with 50 per cent better protection, 80 per cent larger coal capacity, and over 100 per cent more powerful armament.

We can imagine no more convincing argument for a systematic and continuous programme of naval shipbuilding than is presented by a study of these figures. The "Intrepid" was one of seventy-two warships which were authorized in a single appropriation and built with a rush.

THE EFFICIENCY OF THE WATER TUBE BOILER.

The efficiency of the water tube boiler needs no demonstration at this late day; but the coal consumption trials which have lately been carried out on the new cruiser "Diadem" are worthy of note because of the size of the boiler installation and the high economy realized.

The best results were obtained on a thirty hour test at 12,500 horse power—three-fourths of the full power—when the coal consumption worked out at 1.59 pounds per indicated horse power per hour.

IS OUR MARITIME COMMERCE VULNERABLE?

It is a fortunate fact that in the event of hostilities we should be practically invulnerable in a quarter where most nations would be open to disastrous attack. Great and rapidly increasing as is our foreign trade, only a very small percentage of it is carried in American ships.

Nor would our coastwise commerce, which is carried entirely in American bottoms, be so seriously affected as might be supposed; for the fastest of the ships which are in this trade would probably be utilized as auxiliary cruisers, and the merchandise, thanks to our superb system of seaboard railways, could be shipped by land.

Turning from the question of defense to that of attack, we note that the Naval Board appointed for the inspection and purchase of auxiliary cruisers has made a start by adding the late Ogden Goelet's fine yacht the "Mayflower" to the fleet.