Correspondence.

Turret Versus Barbette.

To the Editor of the SCIENTIFIC AMERICAN:

I notice one peculiarity in your description of ships of the British navy, in your issue of Nov. 26. The heavy guns, or main battery, in almost all of them are not mounted in turrets, after the fashion in the United States navy. Why is this? Is it a fact that, when the turret is deranged, the gun is also deranged, and that we have had instances of this difficulty in our navy in time of peace and also during the late war? Why do the American authorities continue to use the turret, if it is liable to seriously affect the working qualities of the ships in question?

What is the object of the British authorities in using such light armor as you mention for the so-called "Canopus" class? It seems to us that ships of that class could more consistently be called armored cruisers than battleships. A. B. C.

Chattanooga, Tenn.

[The system of mounting "en barbette" was adopted in the British navy because of the superior "command" (height of guns above sea) thereby secured. Compare illustrations of the "Resolution" and the "Hood," in the issue referred to. The guns in the barbette ship are 27 feet above the sea and in the turret ship only 19 feet. The turret and the guns turn together and rest upon the same turntable; hence the blocking or displacement of the turret would probably disable the guns. These disadvantages, however, are offset by the complete protection afforded by the turret, not only to the delicate breech-mechanism, but to the gun crew, whose morale cannot but be favorably affected by the fact that they are shielded by a complete wall of 12 or 18 inches of armor. The English have compromised the matter by mounting a sloping gun shield, of a maximum thickness of 6 to 10 inches, upon the gun carriage, which rotates with the guns.

The reduction in thickness of the armor on later British ships (and, indeed, on all other ships) is due to the improved quality of the armor. The 6-inch side armor in the "Canopus" has behind it a sloping 3-inch deck, the two together being equal to 10½ inches of Krupp, or say 13 inches of Harvey armor. The "Canopus" is what the Italians call a cruiser-battleship. She has the speed and protection of the one with the armament of the other.—ED.]

The British Navy.

To the Editor of the SCIENTIFIC AMERICAN:

I have read with much interest the two articles in the issues of November 26 and December 10 upon our navy. As I believe the march of events will compel our navies to act in conjunction in the not very distant future, it is as well that intelligent discussion should be had, so that we may each profit from observing the good and bad points in the other. But in making your criticisms and comparisons, I venture to submit that you have fallen into the common error of critics of our navy, by failing to realize that it occupies a unique position among the navies of the world, and therefore cannot fairly be compared with them ton for ton. The navies of the United States, France, Germany, Italy, Russia, being on the same plane can fairly be thus compared; the duties that their ships would have to perform are more or less similar; they are, after all, only a part of the scheme of national defense; they are not the life blood of the nation. But with Great Britain and her navy it is different. It is not our first line of defense, it is our only line. If our shores bristled with fortifications and we kept a standing army of five million men, of what avail would they be if our navy was defeated and scattered? The victorious enemy would not have to land a man on our shores, would not have to come near us, to reduce us to abject submission, and that in very short order.

This being the case, our navy must act on the aggressive and keep on the aggressive. The enemy's shores must be made our frontier, their fleets must be sought out and defeated or driven into their harbors and kept there. To do this it was recognized that our ships must have sea-going and sea-keeping qualities in a greater degree than the corresponding ships of other nations, to enable them to maintain their positions outside an enemy's port in all kinds of weather and for a long time. So when we design a ship with an eye to matching a rival's ship, we make the armament about the same and then we add on two or three thousand tons to give us room for the extra supplies of coal, ammunition, and stores. Now if we were to pile on armament in proportion to the extra tonnage, we could only do so at a sacrifice of that which is a fundamental law in the designing of our, ships. Thus it comes about that if a war breaks out, the "Jéna," with her 12.052 tons and her four 12-inch and eight 6·4-inch guns, will be matched with the "Majestic," with her 14,900 tons and her four 12-inch and twelve 6-inch guns. And the "Gueydon," with her 9,517 tons and her two 7·6-inch and eight 6·4-inch guns, will be somewhat overmatched by our "Cressy," with her 12,000 tons and her two 9·2-inch and twelve 6-inch guns. This seems to me a fairer way to judge our navy, not ton by ton, but by the ships they would be pitted against in the event of hostilities. Again, it never seems to strike critics that there are two sides to every question. Is it not just possible that the other ships may be overgunned? We know that a Russian cruiser split her decks across while at gun practice on the Black Sea. We know that some of the guns in the French ships could not be fired because the blast of discharge would stun the crews of other guns, and I believe something similar happened on the "Brooklyn" recently.

Such guns are worse than useless. Besides, every ton added above a certain level reduces a ship's steadiness in a sea. This was strikingly illustrated when the Czar visited England. On leaving he was escorted to mid-channel by the British battleships at a 14-knot speed, riding easily and steadily. When taken over by the French battleships his yacht had to slow down to 9 knots, and the French ships were wallowing in the cross seas. What was the "Indiana" doing when her guns had to be lashed? She must have been rolling heavily, as big a mark as ever, but of no value as a gun platform. To drive the argument home, here are some figures:

"Alabama," 11,525 tons; four 13-inch, fourteen 6-inch, sixteen 6-pounders, four 1-pounders.
"Oregon," 10,288 tons; four 13-inch, eight 8-inch, four 6-inch, twenty 6-pounders, six 1-pounders.

The newer ship has 1,237 more tonnage and carries, if anything, a lighter armament. Either the "Oregon" is overgunned or the "Alabama" is undergunned. You warn us in your article to remedy this defect in our future ships. It looks as if you were remedying yours the other way.

In your article, speaking of the large guns of the "Royal Sovereign" class, you say, "the gun crews are entirely exposed." Mr. H. W. Wilson, in his "Ironclads in Action," Vol. 2, page 235, speaking on the same subject, says, "Her (the 'Royal Sovereign') guns are, of course, much exposed. On the other hand, the men working them are most admirably protected." It is clear that one of you gentlemen is in error, and I am not accurately enough informed to say which, though I am inclined to think Mr. Wilson is in the right; for I think the gun crew work below the level of the barbette, the breech of the gun being depressed for loading, etc.

Touching speed, you say that the enemy's commerce destroyers of over 21 knots could only be open to attack by the "Powerful" and her sister, and further on you think the supply of coal of these two ships excessive. It must always be remembered that our speed tests are very severe, conducted as nearly as possible under service conditions, and that the ships are rated for speed at the mean of their natural draught. This is not always the case in other navies, the result being that our ships show a disposition to maintain their averages, while those of other navies fall off. Take, for instance, the commerce destroyer "Columbia." She was specially prepared for her trip across the Atlantic and was ordered to steam at full speed with natural draught until the last day, when she was to use forced draught. She did not average 19 knots. When the "Blenheim" was sent to Madeira to bring home the body of Prince Henry of Battenberg, she was in no way specially prepared, and without using forced draught she made the run to Portsmouth at an average of a fraction over 20·5 knots. I see that the "Argonaut," who has just completed her eight hours' natural draught contractors' steam trial, averaged 21·17 knots, although she is only supposed to be a 20·75 knot boat. In connection with the coal supply of the "Terrible," I should say her usefulness depended more upon her ability to maintain herself at sea in running down her quarry than in the number of our coaling stations. I note that on the 15th of September last the "Terrible," on her four hours' forced draught trials, reached the high average of 25·9 knots.

I am afraid I have been somewhat prolix, but our navy is very near to every Englishman, and I thought I might venture to point out that in some of your criticisms you had approached the subject from a mistaken standpoint. BRITON.

Philadelphia, Pa., December 20, 1898.

[Our correspondent has failed to see that we dwelt at considerable length upon the very facts which he accuses us of ignoring in an article which was intended to be commendatory. We stated in the second article on this navy (issue of December 10) that it was the policy of the British navy to produce vessels "with a moderate number of guns, thoroughly protected and well supplied with ammunition, rather than with an excessive number of guns poorly protected and carrying a limited supply of ammunition. The policy is well suited to the needs of Great Britain, but we think it has been pushed a little too far. If the "Powerful" could throw overboard 1,000 out of her 3,000 tons of coal, and replace it with four 8-inch and four 6-inch rapid-fire guns, she would be sure of any cruiser she could overtake, which is more than can be said of her at present. The reputed 25·9 knots speed of this ship is obviously an error.—ED.]

Miscellaneous Notes and Receipts.

Construction of a Grotto.—A box of suitable height and width forms the foundation. On the upper part, small pieces of a lath are nailed, inside, over the corners, so as to give the necessary arch. Next layout the box with reed, in a suitable manner, allowing the protruding leaves to remain. The box with the reed is now studded with small nails. Next prepare in a vessel enough gypsum, stirred in water, as is thought necessary. This plaster pour into the box and shake the latter to and fro, so that the gypsum enters all the crevices, and especially covers the reed. When it is found that the plaster commences to "set," the box is set up, so that the gypsum can incline downward in the nature of stalactite (filtering stone), and is allowed to harden. When the gypsum has become hard, paint it with suitable size paint, coat a spot here and there with glue, and throw on crushed glass, paste a little moss in some corners, and the Loretto group is done.

If the grotto is not, as is usually done, placed in a niche in the wall, but is to stand free, the outside walls of the box have to be treated in the same manner as the interior.—Der Dekorationsmaler.

Decorating Crude Iron Ware.—This patented process has the purpose of covering crude iron ware with a hard, non-cracking varnish, which is impervious to fire and can be decorated in a new and unique manner by simply coating with a gold solution. The iron varnishes heretofore employed showed the drawback that the colored varnish was not fire-resisting, but turned black in the heat, so that it has been impossible before to obtain a varnish-covering other than black for iron ware subsequently heated in fire.

To give iron articles a fire-resisting, brown varnish coating, proceed as follows: Mix pulverized potassium sulphide, such as is used for galvanic baths, with pulverized copal, pulverized crystalline potassium cyanide, and pulverized sodium bicarbonate. After these substances have been intimately intermixed, a simple coloring body, e. g., Vandyke brown (Cassel brown) is added and mix the whole thoroughly again.

The quantity of the coloring matter is dependent upon the shade of the color which is desired. After that, the compound is so far saturated with absolute alcohol as to form a paste, which is coarsely filtered to separate the undissolved particles. The moist paste, which constitutes a colored mass, is applied on the iron. The latter is then placed in the furnace and heated to 200° C., but may be heated to 300° without losing its color.

After the objects have been taken from the furnace and cooled off, a brush is passed over them, which has been dipped in a gold solution. A painting of the surface or certain parts of it is not aimed at, the object being to have the gold solution appear subsequently only in some places, which gives the article a novel and unique appearance.

Of the constituents forming the varnish, the potassium sulphide effects the firm combination of the varnish with the iron, the copal completes the gloss, the potassium cyanide prevents the oxidation of the iron in the heat and hardens the varnish so that, after it is burnt in, it cannot be removed from the iron, even by the use of steel brushes. After the gilding has been applied in the indicated manner, the object is once more placed in the oven and baked again, so as to permanently unite the varnish and the gilding. The mission of the sodium bicarbonate is to render the varnish easy of working, it being very difficult to apply it on the article without this mixture. If any other than a brown shade is desired, add to the varnish, before baking, some other fire-resisting color or one which changes as desired in the heat, and proceed otherwise as pointed out above.—L. Edgar Andés, in Neueste Erfindungen und Erfahrungen.

Horseless Vehicles for Europe.

It was announced on December 28 that the Fisher Equipment Company, of Chicago, had contracted to furnish a large number of electric vehicles for exportation to Europe during the next ten years. Contracts have been closed with the Holyoke Works, Holyoke, Mass.; Stanley Automatic Carriage Company, Newton, Mass., and the Overman Wheel Company, Chicopee Falls, Mass., to furnish a thousand vehicles a year for ten years. The Massachusetts factories are to turn out steam, gasoline, and petroleum motors, while the Chicago concern will manufacture electric carriages and motor cycles. It is said that 1,500 vehicles are to be made per year by the combined companies, and it is said that the aggregate price to be paid will not be far from $15,000,000. The first vehicles will be shipped in January, and the Paris office will be opened on the Champs Elysées, and branches will be established in London, Berlin, Vienna, and Brussels. The Count de Jotemps, who closed the contract, said: "The American patents on horseless vehicles are the only ones of practical value on the market. In Europe we have nothing that can compare with the American motor-vehicles, either in lightness, easy running qualities, rigidity, or stability. We are satisfied that America will furnish the horseless carriage of the future, and it is our idea to control the supply."