## Correspondence.

### The Armament of the "Alabama" Class.

To the Editor of the SCIENTIFIC AMERICAN:

I am glad that the SCIENTIFIC AMERICAN has taken up the cudgels in favor of fitting our battleships of the "Alabama" class with the new 12-inch rifles of the navy. It seems to me that there can be no question of the wisdom of such a course. If the 13-inch rifles of the armament of these ships as originally planned are made, so much the better. We are in need of a reserve of heavy guns for an emergency, and if they were left unmounted until the new armament is ready, the objection could not be urged that the necessary delay of some months in furnishing the 12-inch guns would leave us unprepared for sudden war. I hope you will continue the agitation, for I believe there is no journal that has done so much to popularize the navy, and the friendliness of the organ to the navy makes its influence with the department very great.

WILLIAM H. HOBBS.

University of Wisconsin, Madison, Wis.

[We are satisfied that the sentiment expressed by Prof. Hobbs is representative of the feeling of the American people as a whole on this most vital question. We publish his letter as being characteristic of many expressions of opinion which have followed our advocacy of the new 12-inch gun as the main arinament of the "Alabama" class.]

### The Lightweight Bicycle.

To the Editor of the SCIENTIFIC AMERICAN:

I am a reader of your valuable paper, and have watched with much interest your criticism of the heavyweight bicycle of 1898.

If I may venture an opinion, I would say that I think you overlooked the cause somewhat in assuming that the heavier machines of to-day are the outgrowth of an attempt to suit the maximum-weight riders out of the regular stock of wheels.

I find from my limited experience that it is not the heavyweight rider who breaks wheels, but the boys and men whose weight will run from 75 pounds to 125 pounds. If I were to place my make of bicycle against another of equal grade for a season's test, I would select as the rider a man of 200 pounds in preference to a boy of 100 pounds.

A very small percentage of heavyweight riders are what we term "scorchers." They are generally men of an age that has caused their common sense to overcome foolishness, and are more careful in their riding for that reason and through fear of an accident and a fall.

The boy and the lightweight man are the riders we fear the most in the problem of construction. The rider that rushes along over rocky roads and over banks with a reckless don't-care-if-I-do-fall spirit is the rider who has called back the heavyweight bicycle.

I agree with you in your claim that the machine should be made to "conform to the weight of the rider," and will add, to the style of the rider, but am unable to see how the large factories are going to do this.

I am doing that very thing, and have been for several seasons, though my business is purely local, and I am always able to learn my customer's style, doing a custom business making wheels to order, as a tailor would a suit of clothes.

I think your diagonal strut for frame is the thing it needs, but believe it would be hard to make the rider accept it at once.

E. C. SHUMARD.

Milford, O.

### "Alabama" and "Canopus" Compared.

To the Editor of the SCIENTIFIC AMERICAN:

I have just read with pleasure your description of the "Wisconsin," United States battleship, as I take great interest in naval architecture, and in the article you make some comparisons between the British battleship "Canopus" and the United States battleship "Alabama," sister ship to the "Wisconsin." To quote from your article, you say that the "Alabama" possesses marked advantages over the "Canopus" in protection and weight of armor and in weight of batteries. I admit that the side armor is, of course, thicker on the "Alabama," but I do not think it is better distributed. The idea of prolonging the belt to the stem may be the best, and is after the French idea, but I think the only real way of testing the two methods would be actual warfare. Moreover, although the armor is thinner on the "Canopus" than on our "Magnificent" class, yet it is of equal resisting power, being of a much better quality, and the "Magnificent" class carries 2,880 tons of armor to the "Alabama's" 2,000 tons; and while the "Alabama's" protective deck is 4 inches to the "Canopus'" 3 inches, the "Canopus" carries an improvement in the shape of an armored main deck of 1 inch in thickness, independently of the curved deck. The main deck thus forms an armored floor for the upper deck 6-inch casemates. The upper deck also has plating to correspond and the other casemates are roofed and floored similarly. In addition to her other armor, the "Canopus" class carries 125 tons of nickel steel on the bows, to the thickness of 2 inches over the ordinary skin, and the ram and associated parts are a solid cellular mass, the material being at once stiff as well as elastic. Therefore, I think that although the "Alabama" may carry more weight of armor possibly, yet, on the whole, I cannot see where she possesses any advantage over the "Canopus," for distribution is as great a factor as weight.

Then, as regards the batteries of the two classes of ships, I think you'll find that in all probability the "Canopus" will carry the latest pattern of 12-inch and 6-inch guns. at all events, the 6-inch anyway; but even supposing they will not carry the latest patterns of these guns, the amount of energy exerted in a given time will be fully as much, if not more, in the "Canopus" than in the "Alabama."

The present 12-inch gun in use has a muzzle energy of 33,020 foot tons, with a muzzle penetration of 36·8 inches of wrought iron, and can be loaded and fired 9 times in 12 minutes. Your 13-inch gun has a muzzle energy of 33,627 foot tons, with a muzzle penetration of 33·5 inches wrought iron, and I don't think it can be handled in anything like as quick time, certainly not with the first breech mechanism that your guns were fitted with.

Then, again, take your 6-inch quick-firer, with a muzzle energy of 3,200 foot tons and a muzzle penetration of 15·4 inches wrought iron, as against the 7-ton pattern 6-inch gun in our service, with a muzzle energy of 3,356 foot tons, penetration 15·9 inches wrought iron and firing 7 rounds in 61 seconds; and if the newest pattern of 6-inch quick-firer is put on the "Canopus" class, it will be 7·4 tons in weight; muzzle energy of 5,373 foot tons; penetration at muzzle, 22·7 inches wrought iron, or 1·6 inches more penetration than your 40 caliber 8-inch breech-loader. Then, again, if I mistake not, the "Alabama's" light battery will consist of sixteen 6-pounders, four 1-pounders, one machine and two light guns. The "Canopus" will probably have ten 12-pounders, eight 3-pounders, eight machine and two light guns.

So that, although the "Alabama" will carry a greater number of guns, they are not as powerful. I don't mean to say anything in any way detrimental as regards the "Alabama," for I take it for granted that she is, or at least she and her sister ships will be most excellent fighting machines; but, looking at both types of vessels from the standpoint of an efficient battleship, i. e., taking into consideration the four great requirements, viz., speed, coal endurance, gun power, and defensive armor, I think, without a doubt, the "Canopus" the better ship of the two. As Lord Brassey puts it, "The weather gage of to-day is the power to outsteam the fleet of the enemy, the power to concentrate quickly, and bring on a general action at the most favorable moment. Speed is an all-important factor in fighting efficiency. It enables the gunner to choose his range far more than helm power, it endows a ship with handiness, and enables her to parry or avoid the blow of the ram. Speed is also a most important strategical factor."

In conclusion, I might say you can't put a quart of power in a pint of displacement. If a ship possesses any one quality in a larger percentage than a fair amount, one or more of the others then has to suffer.

Halifax, Nova Scotia. W. R. SHUTE.

### The New Brooks Comet.

To the Editor of the SCIENTIFIC AMERICAN:

The new comet discovered by the writer on October 20 has been observed at the Smith Observatory on every clear night. While it was circumpolar, observations were made both in the evening and morning sky. From this date the comet will be in excellent position for early evening observations. The comet has been very generally observed from the great observatories, and Prof. Hursey, of the Lick Observatory, has computed the following elements and ephemeris, which has been communicated by the courtesy of the Harvard College Observatory:

ELEMENTS OF COMET BROOKS, 1898.

| | |
|---|---|
| Perihelion passage | November 23. 1898 |
| Perihelion minus node | = 123° 22′ |
| Longitude of node | = 96° 10′ |
| Inclination | = 140° 19′ |
| Perihelion distance | 0·7564 |

EPHEMERIS.

| | Right Ascension. | | | | |
|---|---|---|---|---|---|
| | h. | m. | s. | deg. | m. |
| October 27 | 16 | 35 | 48 | +41 | 31 |
| " 31 | 17 | 9 | 8 | 30 | 11 |
| November 4 | 17 | 30 | 28 | 20 | 30 |
| " 8 | 17 | 44 | 52 | 12 | 41 |
| " 12 | 17 | 59 | 15 | 4 | 52 |

Although the former part of this ephemeris will have expired when this is in print, I have inserted it because it will, when plotted on a star map, indicate the path of the comet through the heavens. By extending it, the approximate place of the comet may be found beyond the latest date given above.

The comet is now in Hercules. It will pass through that constellation in a southeasterly course; pass just above the head and right shoulder of Serpentarius, and thence across the celestial equator. On November 6 it will form a great, nearly equilateral triangle with the bright stars Vega and Altair, below these stars.

The comet is increasing in brightness, and may be observed with telescopes of moderate aperture. It is a conspicuous object in the 10-inch refractor of this observatory, and was visible in the 3-inch finder in the presence of a half moon.

WILLIAM R. BROOKS.

Smith Observatory, Geneva, N. Y., October 28, 1898.

### Colonel Waring.

In our last issue we noted briefly the death of Colonel George E. Waring, Jr., which occurred in New York city, October 29. Colonel Waring arrived in New York from Havana on October 25. He had gone to Cuba, as a special commissioner of the United States, to find out the exact sanitary condition of Havana and to devise some plan of improving the condition of affairs. He contracted the very disease in Havana which he was trying to combat, and this resulted in his death on his return. Colonel Waring was born at Poundridge. New York, in 1833, and received his education at Poughkeepsie, where he studied engineering. He also took a course of agriculture and agricultural chemistry under the late Prof. James J. Mapes. He then undertook the management of Horace Greeley's farm at Chappaqua, where he remained for three years until in 1857, when he was appointed drainage engineer of Central Park, a position which he held until 1861. It was he who designed the present drainage system of Central Park and laid out the beautiful rows of elms on the Mall.

When the Civil War broke out, he went to the front as major of the Garibaldi Hussars. Later he raised a cavalry squadron with others, known as the Fremont Hussars. He was afterward transferred to the Department of the Southwest, where he received the title of Colonel. Colonel Waring obtained prominence as a sanitary engineer at the outbreak of the yellow fever in Memphis. In 1878 he changed the sewage system of that city by introducing methods of his which separated house drainage from surface drainage. This system has since been adopted by a great number of American cities, as well as some towns abroad. In 1882 Colonel Waring was appointed a member of the National Board of Health—a position which he held for a number of years, and in 1894 he became Assistant Engineer of New Orleans. As Street Cleaning Commissioner of New York city, he obtained a national reputation. During his administration the Department of Street Cleaning was thoroughly reformed and reached the highest possible degree of efficiency. For the first time during the present generation the streets were thoroughly cleaned, the employés were uniformed, their work was systematized, and some of the excellent means of disposing of the city's wastes which have been already described in the columns of the SCIENTIFIC AMERICAN were carried out under his direction. When it was decided to send a Government Commission to Cuba for the purpose of selecting camp sites in the island and making provision for sanitary improvements in the chief Cuban cities, Colonel Waring was put at the head of the commission. He made a special study of the conditions in Havana with a view of suggesting plans for perfecting the sanitary arrangements of the city and cleaning out the harbor, plans which, if they are carried out, would tend to mitigate the ravages of the dreaded yellow fever.

### American Water Pipe Abroad.

The subject of American water pipes is creating considerable interest in Glasgow. An order for 1,000 tons of pipe has been given to a Philadelphia concern, in the face of determined opposition. In the first place, the American firm offered to do the work for $24,825, against $28,205, which was the next lowest Scotch bid. The fact that the American pipe was 12 feet long, instead of the 9-foot lengths usual in England, was made the ground for new bidding. The same American firm reduced its bid about $366, and the Scotch firm reduced its offer $3,410, but the American bid was still the lowest, and it was then proposed to give the order to the home firm, because it had a testing machine which could be used. Some members of the City Council objected to this unfairness, and the Scotch firm was given the small pipe. The offer was refused by the firm at the price named, and the American company received the entire contract.

London Engineering says that the Scotch makers have probably not heard the last of American pipe.

### Quarters for Torpedo Boats.

Arrangements have now been made to lay up for the winter the eight torpedo boats which have been in active service during the war. They will be hauled entirely out of water and stored, after some repairs are made, in the New York navy yard. One hundred and fifty thousand dollars have been appropriated for the building of sheds at the Boston navy yard for this purpose, and plans and specifications are now being drawn up.