Correspondence.

Manly Drive for Heavy Gun Mounts.

To the Editor of the SCIENTIFIC AMERICAN:

In the SCIENTIFIC AMERICAN of December 12, 1908, page 429, is a description of a hydraulic drive applied to automobiles. On reading the article it occurred to me that the same principle might advantageously be applied to the mechanism used in traversing heavy seacoast guns and in retracting guns or disappearing carriages from the firing position, when for any reason they have not been fired and returned to the loading position by their own recoil.

JOHN W. C. ABBOTT,
Capt. Coast Artillery Corps, U. S. A.

Fort Barry, Cal., December 23, 1908.

GOOD ROADS AND THE PRICE OF FOOD.

To the Editor of the SCIENTIFIC AMERICAN:

In your issue of December 19 there is an article on "The Political Economy of Good Roads," in which there are several statements which it seems to me, from my viewpoint as a farmer, are misleading.

There is no doubt that country roads are not as good as they might be, and that life in the country would be pleasanter if roads were always good. But it is also true that country roads are reasonably good most of the year; and where the residents of any locality want good roads, they may have very good traveling on dirt roads by proper grading, using the King road smoother to preserve the grade and the wide-tired wagon to prevent rut making.

But the point I wish to make is that the condition of the country road affects mostly the farmer or producer, and only to a very slight extent the consumer.

The price the farmer gets for his product is for it delivered at the railroad, and he gets no more nor less, whether he trots in on a good road or wades through mud.

The cost of the lamb chop, the breakfast roll, or the egg is immensely more affected by the speculator in food products than by the country roads.

The visible supply and the probable demand fix the price both to the producer (at the railway station) and to the consumer.

If, by having good roads the farmer could haul larger loads in less time, he would gain by having more time for other work and save wear on teams and wagons, but the price to the consumer would remain the same, because the price the farmer gets is f. o. b. at the railroad.

It may cost 25 cents a ton per mile to haul produce on country roads when the farmer hires someone to do his hauling, and this multiplied by all the tons hauled may give the frightful sum of $305,000,000 as the cost of getting the produce of the country to the railroad; but as most of the heavy hauling is done at a time of the year when the farmer is not rushed with work, and has horses that would otherwise be idle, he does not feel the burden; and as 50 bushels of wheat or corn and 100 bushels of oats are considered a fair load for two horses, it does not seem that roads are so very bad as the statisticians make out.

The good road is coming, but for many years yet it will have to be made out of plain dirt, and the only benefit the city consumer will get out of it will be the pleasure of riding on it when he comes to visit his country cousins.

ARTHUR PICKFORD.

Nora Springs, Ia.

A NOVEL FILTRATION PLANT.

To the Editor of the SCIENTIFIC AMERICAN:

The problem of supplying pure water to municipalities is receiving so much attention at present, that the idea of a Buffalo man for building a filtration plant is perhaps of sufficient interest to you to warrant its publication in the SCIENTIFIC AMERICAN.

To describe briefly, the plant consists of a cement platform or table built on the bed of the body of water from which the supply is drawn. The table, which is perforated to allow the water to flow through, is of varying thickness according to the weight of the filtering material, which is distributed over its surface, and may be any combination of sand or gravel or other material suitable to local requirements, such as the chemical properties of the water to be filtered or the amount of water to be filtered through a given surface in a given time. This table is supported at intervals by cement columns or legs resting on the bed of the lake or stream.

The sides and ends of the table are separated from the surrounding water by a curtain of the same material as the table, built at an incline, the lower end resting on the bed of the stream, and the upper end on the edge of the table.

After passing through the filter bed, the water is collected in a piping system underneath, and pumped to the consumer.

To supplement the sand and gravel filter, mineral wool may be used if desired in the perforations in the platform, and also in the receivers of the piping system.

This plan is particularly commendable on account of its cheapness, as the item of maintenance is practically nothing, and it can be built on the bed of the supplying body of water, even low enough to prevent its interference with navigation.

If there is a current flowing over the bed, it will be cleansed of sediment by the passing water, and will require no attention except at very rare intervals.

OTTO F. ALARIE.

Tonawanda, N. Y., December 22, 1908.

CLEANING STONE.

To the Editor of the SCIENTIFIC AMERICAN:

The writer hesitates about making the following communication, owing to the simplicity of the process; but the results have been so surprisingly satisfactory, that perhaps your readers may be interested in and benefited by some further description.

The writer had often noticed that the tombstone of a parent at the cemetery, that had been exposed to the weather for some twenty-four years, had become considerably blackened, and had been tempted to have some cleaning done on it, but had seen the comparative futility of such attempts, and let the matter go from time to time.

A short time ago, while at the cemetery on some other business, he happened to have some pieces of sand or flint paper in his pocket, and it occurred to him to try the effect of its application on the stone in question. The effect was so encouraging that he returned later with more sandpaper of various sizes, and working on the flat surfaces with a bold sweep, and on the sunken lettered matter with a piece of the paper wound over the end of a stick, using first a medium coarse grade, and finishing with finer grades, Nos. 0 and 00, he in the course of two hours had transformed the stone into a condition closely resembling its original appearance, and comparing very favorably with one standing beside it, that had been erected within the past three years; the effect was very remarkable, and the work went on with great rapidity.

A cemetery employee who had been observing the process said: "I have been here twenty years, and have seen women come here with scrubbing brushes and various cleaning compounds and sand soaps; have seen professional marble cleaners at work here for days, with blocks of stone and sand and water, and have seen chemical processes, but I have never seen a better result than you have produced in two hours, and that usually in as many days, with sand and a stone and water." He seemed to think that there was some mystery about the flint paper, and wanted to examine it.

There was no mystery; the facts are as follows: Besides the growth of a black fungus, there is a microscopic pitting of the surface of the stone, little granules of marble standing up, and surrounded around their base by dirt of various sorts. The only way to remedy things is to remove a film from the marble and establish a new surface, and this the flint paper does, rapidly and satisfactorily, and at the same time leaves it with a finished surface. It is in fact, in a way, similar in its action to the sand blast, so much used nowadays in the cleaning of marble fronts, only in a smaller and inexpensive way; and in fact might replace the sand blast on smooth marble work for many purposes.

It is a decided success. Ten cents' worth of sandpaper and a little muscle (mixed with a little brains) will transform a tombstone or small monument into the appearance of having been recently erected.

CLAUDE L. WOOLLEY.

Baltimore, December 17, 1908.

International Tuberculosis Exhibit.

An attendance of 350,000 in three weeks at the International Tuberculosis Exhibition is the record-breaking figure reached by the International Tuberculosis Exhibit of the Charity Organization Society.

When, in October, 1908, the Committee on Tuberculosis urged the New York Board of Aldermen to make a $13,000 appropriation toward bringing the Tuberculosis Exhibit from Washington, and maintaining it for six weeks in New York, their hopes led them to name 100,000 visitors as a possibility. With three weeks still to count up, an attendance of a half million is practically assured.

The exhibition itself has been quite fully described, both at Washington and New York. The advertising campaign in New York, drawing into co-operation the most varied and heterogeneous elements of the city's population and progress, has resulted in a definite manifestation of a "people aroused." Tuberculosis can be diminished or stamped out only in proportion as great masses of people rise to fight it, both by guarding themselves against it and by preventing its spread in their families and among their friends. Therefore the city is stimulated to real hope by such a record-breaking attendance.

For the first time in the history of the campaign against consumption, social workers and physicians feel that there is evidence that consumption can be cured, because the masses are arising to learn about tuberculosis.

When the exhibit closes in New York, January 15, it is to be taken almost in its entirety to Philadelphia, where great preparations are being made to house it and to display it properly.

A MULTI-HULL OCEAN STEAMSHIP.

Although the idea of building steam-propelled vessels with multiple hulls is an old one, it does not seem to lose attractiveness to the inventor as the years go by. The illustrations on the front page of this issue show one of the latest proposals of this character. Our artist has made his drawing from the plans contained in a pamphlet entitled "The Ocean Express of the Future," in which the author asserts that in getting out the plans for modern ocean ships our designers are "on the wrong tack for high speed." The prototype of the modern multiple-hull vessel is, of course, the well-known catamaran, in which two long and narrow hulls, or buoyant bodies, are held in a position parallel to, but distant from, one another by a light platform, or even, in the simpler forms, by two transverse poles or spars; the object of the arrangement in this case being to secure stability for carrying a relatively large amount of sail. The most ambitious attempt to produce a successful vessel of this type on a large scale was made nearly half a century ago by Bessemer, the author of the Bessemer steel process. The ship was built with two hulls connected by heavy transverse bracing, and she was driven by paddle wheels running in the channel-way between the hulls. The "Bessemer" was designed for the Channel passage from Dover to Calais. The principal object aimed at was to secure a vessel of sufficiently wide beam to eliminate the heavy rolling, which is one of the chief discomforts of the Channel passage. Incidentally it may be mentioned that the vessel was provided with a large central passenger saloon, swinging upon trunnions, whose axis was parallel with the ship. Manually operated hydraulic plungers were provided for controlling the swinging of the saloon and maintaining it always in the level position. The "Bessemer," however, was found to be impracticable and was ultimately withdrawn from service.

Returning, however, to the triple-hull ship shown in our engraving, it is evident from the prospectus before us that the designer is of the opinion that the principal defect of the present type of single-hull ship is that it presents too great a head resistance to the sea, and that there is a considerable loss of power, due to "eddy-making at the stern." These defects are attributed to the concentrating of the whole of the energy of the engines upon propellers placed at the stern of the ship. He would overcome these defects by dividing his displacement between three hulls which, in the present case, are each 25 feet wide, 500 feet long, and separated by two water channels each 25 feet in width, making the total beam of the vessel 125 feet for a total length of 500 feet. The propellers would be "carried by torpedo-shaped protuberances, which project from the sides of the hulls into the water channel between the hulls. These propeller carriers are arranged in line from stem to stern, and are parallel with the sides of the hull."

The designer of this vessel is of the opinion that if the displacement of, say, a 30,000-ton ship, instead of being contained in a single hull of wide beam, were divided between three hulls of narrow beam, they would cut through the water with a minimum of resistance due to their finer form; and so the objections referred to above would be overcome.

Unfortunately for the success of this proposition, the promoters seem to have lost sight entirely of the important question of skin friction, which results in towing tank experiments and in full-sized ships of finely-modeled form have shown to account for fully one-half of the total resistance. Now, resistance due to skin friction depends, among other things, upon the total area of the immersed surface; and since the triple-hull vessel must, because of its narrow beam, draw at least as much water to secure the same displacement as the single-hull ship, the immersed area will be represented by the six immersed sides of the three hulls instead of the two sides and flat bottom of the single hull of ordinary design. It is safe to say that the resistance due to skin friction would, in the triple-hull vessel, be at least 100 per cent greater than that of a ship of equal displacement of the ordinary type. To this also must be added the increased skin friction and eddy-making due to the series of "torpedo-shaped protuberances" projecting from the sides of the hulls for carrying the many propellers.

It is from the structural point of view, however, that the impracticable character of the proposed ship becomes most evident. Anyone who has crossed the Atlantic Ocean on a large high-speed liner and watched the starting of rivets and springing of plates and beams, when she is being driven hard into a head sea, will understand that it would be a structural impossibility to tie three separate hulls together with sufficient rigidity, except by loading the structure down with a mass of stiffening transverse girders, etc., which would be so heavy as to sink the vessel pretty nearly to her load line, and leave but little of the ship's total displacement for engines, boilers, coal and accommodations. It is easy to imagine what would happen when a 30-foot sea, running diagonally, began to lift the bow which is nearest in the picture, before it exerted its lifting effect upon the other two hulls. The transverse racking strains on the connecting platform at its point of attachment to the hulls would be such, that we question if any system of riveted connections could withstand it. Moreover, in running at high speed into a head sea, the long and narrow hulls would bury in green water up to the superstructure, whose broad, flat surfaces would be subjected to a bombardment that would ultimately start all the riveting, besides flooding the whole after part of the structure with solid masses of water.

The present form of single-hull vessel of the type of the "Lusitania," "Kaiser Wilhelm," and the "Adriatic" is not, as the prospectus before us would have us believe, the outcome of a slow-moving conservatism; it is rather the product of seventy-five years' experience gained in all kinds of weather throughout the Seven Seas.

Death of Andrew Burgess.

On December 18 last, Andrew Burgess died at the age of seventy-one. He was well known as an inventor of firearms of the magazine and automatic type.

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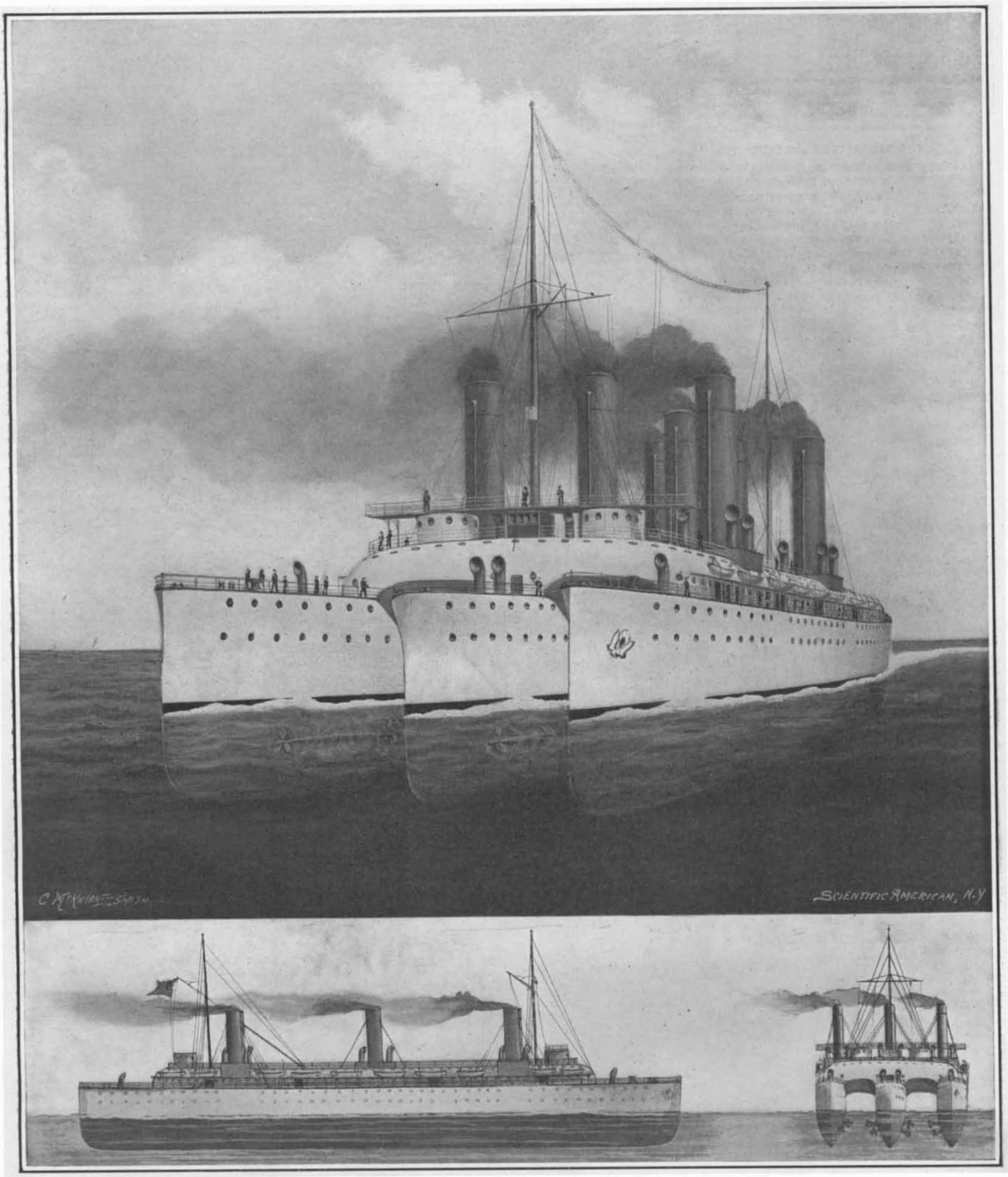

THE LATEST IDEA FOR A MULTI-HULL OCEAN STEAMSHIP.—[See page 23.]