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SCIENTIFIC AMERICAN SUPPLEMENT

No. 772.

For the Week Ending October 18, 1890.

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FLOATING STEAM-PROPELLED ISLANDS OF STEEL.

A floating island made of steel, 1,000 feet long, 300 feet wide, and drawing 26 feet of water—such is the type of ship as described by Sir Nathaniel Barnaby, constructor for the British Navy, at the recent sitting in Pittsburg, Pa., of the Iron and Steel Institute of Great Britain. With engines of 60,000 h. p. such a craft, he said, ought to make 15 knots an hour—a speed, we will add, which, though only three-fourths of that now logged under favorable conditions by crack ships, would be quite fast enough for most ocean travelers if the promise of steadiness under all conditions of weather went with it.

The plan of loading and unloading such a craft is bold and original, and carries with it an air of practicability that is its best recommendation. To build docks for such a ship would be at once inconvenient and costly, and even with these existing it would be hazardous to maneuver so unwieldy a monster in such narrow waterways as the Mersey or our own Hudson and East rivers. This being the case, the mind naturally reverts to barges and lighters. With this system of handling cargoes applied to the present type of ship the expense would be enormous, demanding, as is evident, two extra handlings, one at each end of the voyage.

Constructor Barnaby would load and unload his ship in midstream by lighters, and, instead of breaking their bulk, would take them aboard, hull and cargo, for his plan includes a clear sheet of water for them 'tween decks, a miniature harbor into which they may be floated at one port and floated off again at another. Once the lighter fleet containing the ship's cargo is properly arranged aboard, the floating basin can be pumped dry and all comfortably stowed for the voyage—the sea being let in again after the ocean has been crossed, and the cargo thus distributed in many bottoms floated ashore. The later plan is to keep lighters and steam tugs permanently floating aboard.

Let us suppose that the practicability of the system, so far as spare buoyancy is concerned, has been carefully determined, and that the basin with its waters and their burdens would not overcome the buoyancy of the ship, then surely the system has many advantages.

The present delays in stowing cargo and breaking out would be obviated, for, if a duplicate set of lighters were in use, the various sections of an outward cargo could be prepared before the ship was arrived. But far more important would be the saving of expense and convenience of distribution, once the ship was in and the various sections of her cargo broken out and floated into the stream; the lighters containing freight being dispatched to various parts of the shore line directly to the railway termini, thus saving always one and sometimes two handlings.

"I have never thought that size is a disadvantage in merchant ships, supposing they can be worked financially." This is what Constructor Barnaby told the iron and steel men. "On the contrary," said he, "the advantage arising from size in passenger ships seems to me to be so great that I do not see where we shall stop. In considering the problem, two sets of apparent difficulties confronted me, viz., those connected with the building of the ship afloat and those relating to receiving and discharging cargo. The ship would be a steel island, incapable of entering any docks. The building difficulties soon disappeared. They had no real existence. To meet the other difficulties, I propose to form shallow still-water harbors or docks within the ship, entered by gates in the sides, and to carry, always afloat there, the loaded barges and tugs; turning the barges out and taking in fresh ones already loaded at the ports of discharge and shipment.

"Such a ship would require to be fortified and garrisoned like a town. She could be made absolutely secure against fatal injury arising from perforation. The subdivisions required for this purpose might be made to serve effectually against the spread of any local fire. I do firmly believe that we shall get the mastery over the seas, and shall live far more happily in a marine residence capable of steaming fifteen knots an hour than we can ever live in seaside towns."

It may appear to those who have observed the effect of liquid in a moving basin that the commotion of the liquid in this floating harbor would tend to unsteady the ship. While this is quite true where the weight of the water approaches that of the basin, the reverse is the case where the fluid is but a fraction of the weight of the vessel containing it. For, as the constructor points out, "when a loose weight is moved about violently by the rolling or pitching of a ship, the tendency is to bring the ship to rest." Whoever may have been aboard a war ship in a storm, when a gun has broken loose, will see the force of this remark, and it is because of this now well understood principle that, as he explains, the larger ships of the British navy are being built with water chambers above the shotproof decks.

If the calculations are correct and the principle is properly applied to the 1,000 foot ship (she may be much longer than this, he says), there should not be any pitching, rolling, or heaving, however heavy the seas around her.

An important point in this discussion upon which the distinguished naval constructor is altogether silent is: How much will the presence of these floating islands upon the ocean increase the peril of navigating smaller craft? It would seem as if ordinary sail and steam traffic would be forced to forsake such paths as they traversed.

THE VISIT OF THE BRITISH IRON AND STEEL INSTITUTE.

The regular fall meeting of the British Iron and Steel Institute, in New York City, closed its session on October 3, when a great proportion of the six hundred delegates in attendance commenced a round of visiting with the object of inspecting the most prominent of the industrial establishments of the country, more particularly its coal, iron, and copper mines, its iron and steel mills, and its leading engineering works. During the five days the visitors were in New York City every facility was offered for their inspection of local objects of interest, prominent among which were the Brooklyn Bridge, the new aqueduct, and the bridges over the Harlem River, Edison's establishment at Orange, N. J., with numerous carriage parties on the beautiful uptown drives of New York City, and excursions by water to all the many interesting points so abundantly to be found in the vicinity of the city.

On the morning of October 4, a long special train whirled the visitors away over the Pennsylvania Railroad, making its first stop at the great saw and file works of Disston & Sons, the party here dividing up into groups, and, with the attendance of a numerous committee, examining into the American methods by means of which iron and steel are converted into saws and files. Mr. Joseph D. Potts, of the local committee, in welcoming the visitors, expressed the hope that they would there find "some fresh physical discoveries, and some new and successful applications of old knowledge suitable for use in similar processes at home," and that they would be "as much interested in the people who execute our industries as in the industries themselves."

From Philadelphia an excursion was organized to visit the works of the Phœnix Bridge Company, and the blast furnaces and rolling mills connected therewith, other establishments visited being the George V. Cresson Machine Works, the Harrison Boiler Works, and the shops of the Link Belt Engineering Company, a large party being also made up for a special visit to the Baldwin Locomotive Works, and another party paying a visit to the Camden Iron Works. Sir James Kitson is said to be at the head of the largest locomotive works in England, but their production only amounts to about 150 engines a year, while the Baldwin Works manufactured last year 827 locomotives, and expect to turn out 1,000 this year.

The Cornwall ore hills and blast furnaces and the big furnaces at Lebanon received brief visits during the progress of the party to Altoona, Johnstown and Pittsburg, where an international convention was held, on October 9 and 10. At the Altoona shops of the Pennsylvania Railroad several hours were spent by the visitors, who are said to have found some machines here that were entirely new to them, particularly the track indicator and dynamometers, for detecting inequalities in the rail service, or irregularities of gauge, and for recording the speed of a train and the weight pulled by the locomotive. It is said that another curiosity for the visitors was an automatic stoker and furnace into which coal is fed and from which the ashes are removed by machinery. At Johnstown the visitors were driven through the Cambria Iron Works, and for the first time saw the wonders of natural gas.

The Pittsburg sessions of the convention were held at the new Carnegie Library, at Allegheny, J. H. Ricketson, of Pittsburg, making the introductory speech, which was appropriately replied to by Sir James Kitson, who also read a letter from Sir Henry Bessemer, detailing the history of the Bessemer process, in which it was said of one Sheffield firm that "by the mere commercial working of the process, apart from the patent, each of the five partners retired after fourteen years with eighty-one times the amount of his subscribed capital, or an average of nearly cent per cent every two months."

Among the important papers presented to the convention were: One by Sir J. Lowthian Bell on "The Future of the Iron Manufacture," one by Sir Nathaniel Barnaby, chief constructor for the British Navy, on "The Protection of Steel and Iron Ships against Foundering from Injury to their Shells, including the Use of Armor," and one by Mr. A. E. Seaton on "The Development of the Marine Engine and the Progress made in Marine Engineering during the last Fifteen Years."

After their first meeting at Pittsburg the visitors were taken to the Wildwood oil field, about six miles distant, where they saw oil wells in various stages of operation, drilling, pumping and flowing, one of the wells being shot with nitro-glycerine while they were there. There were also excursions to Davis Island dam and the Ohio connecting bridge; to Wilmerding, the site of the Westinghouse Air Brake Company's works; to the Monongahela Gas Company's mines, which are