THE FLEET OF THE FUTURE: IRON OR WOOD ?

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FLEET OF THE FUTURE:

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CONTAINING

A REPLY TO SOME CONCLUSIONS OF GENERAL SIR HOWARD DOUGLAS, BART., G.C.B., F.R.S., &c., IN FAVOUR OF WOODEN WALLS.

BY

J. SCOTT RUSSELL, ESQ., F.R.S.

MEMBER OF COUNCIL OF THE INSTITUTION OF CIVIL ENGINEERS, AND VICE-PRESIDENT OF THE INSTITUTION OF NAVAL ARCHITECTS.

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THE question between wooden walls and iron defences has become so important to the security and independence of England, that it can no longer be treated as a theoretical and technical speculation merely. It is one upon which practical issues of national importance must at once be taken.

It is unfortunate, that at so critical a moment, a distinguished general officer of great knowledge and high rank, Sir Howard Douglas, should have come forward as the advocate of wooden walls. But that circumstance makes it the imperative duty of those who believe in the greater efficiency of iron defences to meet his arguments and refute his conclusions.

It is well known that for some twelve or fifteen years, distinguished men, in the navy and out of it, have been gradually coming, by a course of practical experience and careful observation, to the belief that iron ships possess many advantages over wooden ships for purposes of war. Some fifteen years ago it was found by Captains Hall and Charlewood that in action iron vessels presented the advantages of turning aside shot fired obliquely; of being more easily repaired when damaged; and of being less easily set on fire than wooden ships. Some twelve years ago I built some iron vessels of war which possessed the advantage of carrying heavier armament, drawing less water, and

steaming faster than any wooden vessels of war of the same size, and they afterwards did good service in the Sea of Azof.

But the capture of Kinburn seems to have been the turning point in this question, as the effects of shot on the iron-plated vessels of the Emperor Napoleon satisfied him of the comparative invulnerability of iron sides, and decided his policy for the future in favour of iron defences.

Encouraged by his example, the advocates of iron war ships in England have continued to urge their views with increased energy and tardy success. At this moment it is believed that France has gained material advantages by her willing and ready adoption of iron-coated ships, and that we have lost much by our tardy and reluctant adoption of the new element of defence.

As naturally happens, a large and strong party has opposed an iron war fleet as a novelty, and have done all in their power both in the Admiralty and out of it to retard the introduction of iron. Sir Howard Douglas is the exponent of the views of this anti-iron party. He proves in his pamphlet on iron defences, to which I propose some reply, that he has been for many years the influential and successful opponent of the use of iron for ships of war. How he has exercised that influence he frankly tells us. "*I was consulted by the late Sir Robert Peel, on his accession to the government, as to the use and efficiency of a certain half-dozen iron frigates, two of which were finished, and four constructing by contract. I stated in reply that vessels wholly constructed of iron were utterly unfit for all the purposes of war, whether armed or as transports for the conveyance of troops.*" How fatally successful this advice was we now know only too well.

In his most recent publication on this subject Sir Howard Douglas continues to use the same arguments to the same effect. It is therefore necessary to state and refute them. We state the case against iron ships in his own words.

"The question which I proposed to examine was as follows:—Whether ships constructed wholly, or nearly so, of iron, are fit for any of the purposes and contingencies of war. I came to the following conclusion:—first, That ships formed wholly, or nearly

so, of iron, are utterly unfit for all the purposes and contingencies of war, whether as fighting ships or as transports for troops; 68-pounder solid shot would pass through the "Great Eastern" with tremendous effect, and the perforation in the outer shell could not be plugged up; she is an awful roller, and has never attained anything like calculated speed; second, That thin plates of iron, even ⅛ of an inch thick, are proof against shells or hollow shot in an unbroken state, but that the fragments of the shot and shell pass through the plates and produce an effect perhaps more formidable than any shell; third, That being proof against shells will avail little unless the vessels are likewise proof against solid shot; fourth, That the thickness of plates required to resist shot fired from the heaviest nature of gun must not be less than 4½ inches." To this he adds that if the iron be not backed by wood, the thickness must be increased to 6 or 8 inches.

Such are Sir Howard Douglas's conclusions. The arguments by which he supports them are not so easily condensed. He founds them partly on a long series of experiments made by the Admiralty, and communicated to him for publication. These experiments show that a plate of iron, struck repeatedly in one place, will at last be broken. This seems to us to be his ruling fact. He then argues, that as the thickness of such a plate must be six or eight inches, or more, no ship can be built to carry such a weight, and, at the same time, retain the qualities of a good ship. He thus constructs a dilemma, out of which he thinks the advocates of iron cannot escape; as thus—More than six or eight inches of thickness are necessary to the perfect impregnability of iron. This weight of iron cannot be carried without destroying the sea-going qualities of a ship. Therefore, a vessel of war cannot be made at once impregnable and a good sea-boat.—Q. E. D.

In reply, I shall have to state that the respective merits of wood and iron are not tried truly on this issue. There is no such question raised by those who prefer iron ships of war to wooden ones, as this of Sir Howard Douglas. Absolute theoretical im-

pregnability is an absurdity. It is difficult to conceive a plate of iron so thick, that if you go on continually firing 68-pound shot on the same place you will not at length injure the plate.

The question at issue is this.—Is iron less liable to injury by the missiles of modern warfare than wood? not, Is it absolutely invulnerable? Can iron of moderate thickness be so arranged in the formation of a ship as to give it a much higher degree of invulnerability than wood? And can a ship, so protected, have as many or more good qualities than a wooden ship of the line? And will the balance of advantage lie, on the whole, with the wood or with the iron?

I undertake to show that there are means known to us by which vessels of iron may be constructed so as to have, on the whole, a large balance of advantage over wood. And I also undertake to state the general conditions under which these results may be obtained, and an iron fleet constructed in every way superior to a wooden fleet.

Preliminary, however, to the main argument, I am obliged to show that one of the facts on which Sir Howard Douglas concludes against iron ships, even the most large and powerful, is an assumption of his own, and not a fact; he states:—

THAT SHIPS FORMED WHOLLY, OR NEARLY SO, OF IRON, ARE UTTERLY UNFIT FOR ALL THE PURPOSES AND CONTINGENCIES OF WAR, WHETHER AS FIGHTING SHIPS OR AS TRANSPORTS FOR TROOPS; 68-POUNDER SOLID SHOT WOULD PASS THROUGH THE "GREAT EASTERN" WITH TREMENDOUS EFFECT, AND THE PERFORATION IN THE OUTER SHELL COULD NOT BE PLUGGED; SHE IS AN AWFUL ROLLER, AND HAS NEVER ATTAINED ANYTHING LIKE CALCULATED SPEED.

As designer of the lines of the "Great Eastern," and as professionally responsible for all her sea-going qualities and points of naval architecture, it becomes my duty not to allow the public interests to suffer, as they must do, if these facts are assumed *and deductions* accepted and acted upon by the Legislature, which

in the ensuing parliament must vote its money either for the construction of the new fleet or the continuation of the old.

Sir Howard Douglas's conclusion consists of:—

1. A fact.—The "Great Eastern" is an awful roller.

2. Another fact.—The "Great Eastern" has never attained anything like calculated speed.

3. A prediction.—68-pounder solid shot would pass through the "Great Eastern" with tremendous effect.

4. A belief.—"The perforation in the outer shell could not be plugged."

5. A conclusion.—"Ships formed wholly, or nearly so, of iron, are utterly unfit for all the purposes and contingencies of war, whether as fighting ships or as transports for troops."

I undertake to show—

1. That the alleged fact is the exact contrary of the truth.

2. That the second fact is like the first.

3. I shall give a measure for the meaning of "tremendous effect."

4. I shall define the limits of the belief that the perforation in the outer shell could not be plugged.

Lastly. I shall show that the true facts, even in the form in which Sir H. Douglas could not escape adducing them, have disproved his own conclusions.

After having negatived Sir Howard Douglas's conclusions, I think I shall be able to establish the following counter-conclusions:—

1. That iron steam-ships of war may be built as strong as wooden ships of greater weight, and will be stronger than wooden ships of equal weight.

2. That iron ships of equal strength can go on less draft of water than wooden ships.