When a propeller is to be designed for any given set of conditions, it is of the first importance that the relation between the mass of water acted upon and the acceleration imparted to it should be such,

That while the product $\frac{WS}{g}$ shall equal the estimated resistance of the ship, and the size and rate of motion of the propelling apparatus such as shall suit the conditions of the case, the economic result may yet be the best attainable, or may only fall short of the maximum by an amount which is calculable, and which it may be desirable to sacrifice in order to obtain other advantages.

(p. 3) There is a certain quantity of work which must be lost under all circumstances, and it is equal to the amount of energy of the discharged water moving astern with a velocity S relative to still water.

As this energy varies as the weight multiplied by the square of the velocity, it follows that if the quantity of water acted upon is doubled, the loss from this cause is doubled, but if the acceleration is doubled, the loss is increased fourfold. This explains why the hydraulic propeller, which is forced to act upon a much less area of column than the screw, appears at such a disadvantage when compared with it.

Pulling versus Pushing.

(p.44) In the well-known Mersey ferry boats there are four screws, but in some of those built in America two only are employed, one forward and one aft, driven by the same shaft, an arrangement which appears to be inferior.