Cleveland O Feb/97

My dear Judge

I have yours of 31st ult and since its receipt have studied pretty thoroughly your system of aquatic propulsion & find I am too stupid to see the merit you claim for it — In fact I conceive it will be a great waster of power inasmuch as at no point of its application does it exert its full force to propel the boat directly forward — The forward movement is simply a resultant of a counter-acted tendency of the boat to move first in one direction

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and then in the other & as the boat presents less surface resistance in the direction of the keel extension it moves forward — A boat moved by a single scull if applied in one direction only will turn as if on a pivot apply the power in an opposite direction and the resultant is forward but you have lost all the power exerted in moving the boat other than straight ahead — In other words the true exertion of your power is ~~~~ you counteract by using two sculls which I suppose you cannot expect to be able to work at greatest point of divergence to exceed an angle of 45° to the line of the keel and at that point are at greatest efficiency & which is retained for a time by the flexibility of the propellor — any gain in this would seem to be lost however after the blade has returned & passed beyond the keel line to point of convergence and right there seems to come the loss of power — Modified somewhat by the flexibility of the blades — I doubt if I have made myself plain but if you have imitated the fish you have lost sight of the fact that he is a propellor from nose to tail — he is flexible throughout

and lubricates his passage through the water — he only moves in a Straight line after having acquired a Momentum & uses his tail Simply as rudder. I have not bothered about Stopping or backing although I think if you brought the blades to a rest at the widest point of divergence or if you Could So operate them that they would rapidly Converge after passing the Keel parallel the boat Could be Stopped & backed — This would involve engine Construction and Manipulation beyond my Conception. I take it for Conservation of power feathering paddles are the best

but there are many other objection and the Screw will have to do. The only loss of power is that it has to be dragged through the water but at no point in its revolution is it inactive or varying in its efficiency. It has a Constant push & is only Minus the power required to overcome its inertia plus the resistance of its blades which is Called its drag —

As I Said before however you have made a practical test & this might upset my argument — It would Seem Strange to me however that men who have made a life Study of such things Should have overlooked your Method if a good one. It must be Conceded however that the greatest efficiency.

and Conservation of energy is in application of the power at right angles to the direction of propulsion — I got the Inter-Ocean yesterday and I Commend you for the most outrageous peace of Sarcasm I ever saw. I dont know that you meant it for that but if Alger has anything to recommend him but wealth I cant see it — I dont think he can do any harm but to me he looks everything and must have been picked up on the "bargain Counter" Well the time is near at hand & we shall see.

Yours Truly
A M Robbins