Winans' New Steamer—Interesting Statement of the Builders.

MESSRS. EDITORS:—We observe that, in noticing our plan of steamer in the SCIENTIFIC AMERICAN, you append some remarks in relation to the probable result of the experiment which we are about to make, and that you have discovered many objections and no virtues connected therewith, in which one-sidedness of opinion put forth to the public (so far as we are aware) you stand alone. We take no exception to anything you have said in relation to the probable result; but, on the other hand, we deem it not only proper but a duty which a paper like yours, professing to be the true exponent of the mechanical sciences, owes to its patrons, to discuss such subjects as they come up, in advance of actual trial, with a view to ascertaining how their solutions as determined antecedently by science, deduction, and reasoning, correspond with those solutions subsequently determined by actual practice. We shall therefore be pleased to have you further discuss this matter in the SCIENTIFIC AMERICAN, and to give your views freely and fully. Hoping that you will do so, we will mention some of the prominent objections that have been made to our plan of steamer by scientific and practical men, and give you our views in relation to these objections as well as those made by yourselves:—

Objection 1.—"It is without sails, so that if any accident occurs to the machinery, it must lie a helpless log upon the waves."

To this we answer that the propelling wheel is driven by four distinct engines, any one of which is, as we believe, capable of driving the vessel ten miles per hour. These engines are supplied with steam by two separate boilers, situated in different ends of the vessel. Two of the four engines are coupled on to one end of the propelling shaft and two of them on the other; so that one or more of the engines can be detached without interfering with the working of the others. Further: the arrangement is such that, if the crank pin or journal of the shaft should give way on one end, the vessel can be propelled with good effect by the engines which gear on to the other end. The propelling wheel is better shielded from injury than either the ordinary screw-propeller or the side paddle-wheel, and is, from its make, less liable to damage. The propelling wheel shaft is, from its shortness, compactness, and the smaller strain to which it is subjected in proportion to the power exerted, less liable to injury than the shaft of either of the ordinary propelling wheels above mentioned. The vessel has two rudders, either of which will steer it well. Hence, we believe that the chances of our vessel becoming so deranged as to leave it without steam propelling power or steering apparatus are two or three-fold in its favor as compared with ordinary steam vessels. But should it be left without steam power, then, and not before, will sails make their appearance externally on the vessel, sufficient to keep steerage and headway on it; the smoke-pipes answering the purpose of masts to rig the sails upon. Such has been our plan, and such will be the arrangement; but if, by possibility, our vessel should be left without any propelling power, and "lie a helpless log upon the waves," we believe it will be very much safer in such condition than it would be if constructed on any other plan of sea-going steamer now in use, and also less liable to remain in such condition.

Objection 2.—"However strongly its parts may be secured together, its shape is an unstable one."

We presume this means that it is unstable because the outline of the cross section of each and every part of the vessel is a circle. Now, we believe that our vessel, because of its circular form, when used in combination with the low position of the machinery, anchors, chains, and other necessary appendages, and when propelled by steam power only, will have much less side motion or rolling on its longitudinal axis in a rough sea than any sea-steamer now in use. Vessels carrying sails and other ordinary appendages obtain staunchness by deviating from a circular immersed cross section; the stability gained in this way acts in conjunction with the ballast and loading of the vessel to furnish the necessary fulcrum for the moving power of sails, acting as it does, many times the breadth of the vessel above the resistance to be overcome. To a vessel having the ordinary spread of canvas in proportion to tunnage, this resorting to shape in aid of ballast and load to furnish the fulcrum above mentioned is perhaps indispensable, but not so in a vessel propelled wholly by steam as our is; in the latter case the power, instead of being applied high above the water or point of resistance, is applied directly on a line with the resistance to the motion of the vessel; the ballast furnished (as before stated) by the machinery, &c. of our vessel being amply sufficient to give it greater freedom from rocking than usual, and especially when taken in connection with the peculiar position of our rudders, which are "balance rudders," two in number, projecting with their entire surface below the bottom of the vessel, and thus acting with great efficiency to prevent accumulation of rolling or oscillation; and also when taken in connection with the numerous radial wings or vanes connecting the body of the vessel to the outer sleeve, which wings form channels parallel to the motion of the vessel, through which a large bulk and weight of water is constantly passing with great rapidity when the vessel is in motion; thus powerfully resisting any tendency to rocking or oscillation. The shape which is usually adopted, to aid the ballast in giving stability to sailing vessels, acts well and in harmony with the ballast when the surface of the water is level or nearly so; but it is far from acting well in assisting to keep the deck of a vessel level when the surface of the sea is quite rough. The more the shape of the vessel produces resistance to being careened or rocked sideways, to and fro, on smooth water, the greater is the power of the waves when the water is rough to rock it sideways, back and forth. Such is not the case in relation to the resistance to side-rocking obtained by ballast placed low down in the vessel, for this resistance is constant and uniform in its action for good, whether the water be rough or smooth; therefore, for a sea-going vessel designed to be propelled by steam alone, it is decidedly best to depend exclusively upon ballast for stability, and to make the vessel perfectly round throughout its cross section, which shape more perfectly than any other disarms the waves and rough water of their power of disturbing that position which the ballast of the vessel constantly tends to maintain.

Objection 3.—"Theory and practice have demonstrated that the 'wave-line' system is the true one on which to construct vessels that are to cleave the waters with *safe* rapidity, but this boat does not admit of these lines."

If our vessel were a solid instead of being a a hollow spindle, and all the material in it so arranged—without moving any of it backwards or forwards—as to make the bottom and top lines straight and parallel with each other, it would produce a much more perfect form of "wave-line" vessel than is to be found in present use. The side lines would be composed of reversed curves giving the hollow bow and stern and swelling middle. But we are persuaded that, when the solid spindle was in the form of "wave-line" just described, it would meet with greater resistance in passing through the water than when in its present shape, for the reason that more surface would be presented to the water, and the water would move out of the way of the vessel and fall in behind it by lines less easy and short than will be the case with the form we have adopted.

Objection 4.—"The long and narrow ships have been found to roll almost too much as it is; what then may be expected from a ship much narrower in proportion than any ship now built, and which is so shaped as to sail equally well in any position?"

The increased length being about 50 per cent, you will probably insist that the increased tendency to roll will be 50 per cent also. If you should be right in this, we feel persuaded that the round form of our vessel (for the reason before given) will more than counteract this increased tendency to roll, and that, under all contingencies, our vessel will roll less than ordinary sea-going steamers do. But our views with regard to increased tendency to roll, caused by the greater length you mention, when applied to our plan of steamer, are exactly the reverse of yours. We believe that, while the breadth of beam of our vessel remains the same, the greater the length (the ballast being increased in proportion to increased tunnage) the less the tendency to roll sideways, or to undulate endways; the reason for this is that the increased surface presented to the water and the greater *vis-inertiæ* of the mass both increase the resistance to rolling, and these resistances and each of their parts act constantly in conjunction and harmony with each other. Such harmony of action is not the case with the forces that tend to cause this rocking motion. The force coming from the undulatory surface of water in rough weather (and this is the chief force with our plan of vessel) not only loses harmony of action as the vessel is increased in length, but one portion of such force counteracts the other portion all the better as the length of the vessel is increased. Our reasoning is assisted in this by imagining a vessel built on our plan, of 16 feet beam and *several miles* in length. The numerous waves that would be constantly acting in opposition to each other, and the shortness of the time that any one or more waves would be left free to exert a rocking influence unopposed by the counteracting influence of other waves of equal or nearly equal energy, would be such that very little rocking would take place, even if the sea were ever so rough. If you say that this does not represent the case agreeably to your meaning, and that to do so, the comparison must be between vessels of equal tunnage, and consequently that, as the length is increased, the breadth of beam must be diminished, so as to preserve the tunnage equal; then, to meet this view of the subject, we will suppose two vessels of 4,000 tuns burden each, built and propelled on our plan, one of them being 300 and the other 600 feet in length. We believe that the longer and narrower vessel will have less objectionable motion, when all the rocking and undulations are taken into the aggregate, than the vessel with the broader beam and half length; because the double length, upon the principles before stated, will be of important advantage in diminishing side-rocking, and will also materially diminish longitudinal undulations.

Again, we will suppose two vessels of our plan and mode of propulsion, both being 500 feet in length, one of them being 20 and the other 40 feet in diameter, both being without smoke-stack, ventilator, and hand-railing, and the center of gravity of each being equally low down in proportion to their diameter; in this case the rocking of the narrow vessel would be no greater than that of the other; for the reason that the force and the lever by which it acts to rock the vessel, and the force and the lever by which it acts to resist the rocking, are at least as favorable, upon an average, to the small vessel as to the large one. In practice, the vessel of smaller diameter may require higher smoke-stacks and ventilators in proportion to diameter, and thereby slightly increase the leverage by which the wind tends to rock the vessel by its action upon them. In this way the narrower vessel may suffer a slight but scarcely appreciable disadvantage as compared with the vessel of larger diameter; but when compared with the ordinary sea-going steamers, a decided advantage will be had by our plan of vessel.

Objection 5.—"Iron ships are now constructed, and the use of this material, and the construction of ships in compartments, on which Messrs. Winans lay so much stress, is, as perhaps our readers are aware, not novel."

We are not aware that any ships have been constructed *entirely* of iron, as is the case with ours. Heretofore, iron ships, like most brick houses, have had so much wood used in their construction, independent of their cargo, as to render them destructible by fire. Not so with our vessel, the plan of which peculiarly adapts it to be constructed entirely of iron. We believe ourselves to be the first to construct a vessel positively fire-proof; that the plan of our vessel is peculiarly adapted to the use of secure and numerous water-tight bulkheads; and that our steamer is the first intended and so arranged as to carry passengers apart from a combustible cargo, (except the mail and such other small articles as can be put into iron air-tight cases or compartments,) and to thus render the burning of the vessel at sea quite impossible. We do not think we have laid too much stress on the importance of doing this. We are not aware that we have said or written anything to warrant the conclusion which you appear to have arrived at, to wit: that we claim, as a novelty, the use of iron in the hulls of ships, or the use of water-tight bulkheads in ships.

Objection 6.—"On the whole, looking at past experience in shipbuilding, we have no hesitation in saying that the 'cigar build' will prove no success, and that the experimental one will most likely be the last."

To this sweeping objection we shall at present only say we differ with you in opinion, and hope that you will publish, at greater length, your reasons in support of such conclusions, together with our own views and reasonings herein set forth.

It has been said, further, that our vessel will bury itself so deep in the water, when running at full speed, as to be rendered impracticable from this cause alone. What are your views with regard to this assertion, and also as to the speed which our vessel will be able to maintain in smooth as well as rough water? Each of the four cylinders is 24 inches in diameter and 26-inch stroke; and each of the two boilers has about 1,500 superficial feet of fire surface and 40 feet of fire-grate; the fire in the furnaces is to be urged by exhausting the steam from the cylinders up the chimney, after the plan of locomotive engines; the pressure of steam is to be 100 pounds, and a variable cut-off; the vessel is 180 feet long, 16 feet beam, and 350 tuns displacement of water.

In our circular we also gave our ideas as to the advantage of our plan of propeller; we would be pleased to have your views on this subject also. If your views of our plan of vessel shall prove to be correct, it will result in an increased confidence in the public mind in your teachings on such subjects.

ROSS WINANS.
THOMAS WINANS.

Baltimore, Md., Nov., 1858.

Useful Composition.

A composition has been patented in London, for manufacturing molded articles from a mixture of the asphaltum of tar and fine brick dust. This asphaltum is the residue left in the retorts in distilling gas tar to obtain naphtha; it is kneaded with one part of brick dust, and then molded into the desired form for picture frames, or any other article desired. From such cheap materials it is thought that a composition may be made which can be vulcanized, and from which articles like canes and combs, may be manufactured. In Paris a compound of albumen and sawdust is proposed for the manufacture of various molded articles. Pure albumen, obtained either from eggs or blood, is slightly diluted with water, and in this fine sawdust is soaked; it is then submitted to severe pressure in a press, after which it is forced into metal molds, which should be kept heated during the process of fabrication. As soon as the molding is completed, the mold is plunged in cold water, to cool the articles.