## THE WINANS STEAMSHIP.

MESSRS. EDITORS:—On page 412, Vol. I. (new series), SCIENTIFIC AMERICAN, you published some extracts from the letter of the Norfolk correspondent of the New York *Herald*, in regard to the trial trip of this vessel upon the ocean The following statement may not be uninteresting:—

When the Messrs. Winans planned their ship, improvement seemed to have very nearly reached perfection in adapting to the use of steam those forms of nautical construction originally contrived for sails and oars. For inland navigation generally, the American river and lake steamers—for the commercial marine, the Collins and Cunard lines—and for war, the steam navies of France and England—had apparently accomplished everything in these directions, and upon this model, of which science and ingenuity were capable. Yet, while the time of transit was greatly accelerated; little has been done, comparatively, towards the *desiderata* of safety, economy and uniformity in the transportation of persons or property. Steamers still went down at sea, were destroyed by fire, or were cast upon the shore; and the length of their passages was still dependent, though in a much less degree, upon the same contingencies of the seasons that had impeded sailing vessels. As to economy, every new ship on all the leading lines was made more expensive than the last. Government subsidies became necessary to their existence. Without (at least) mail contracts, they ceased to be remunerative. If any great improvement was to be looked for, then, in these particulars, it was clear that it must be in a new direction; so, striking out accordingly, the Messrs. Winans adopted the form with which the public have since become familiar, especially through the illustrated press. Building their vessel wholly of iron, of a shape approaching a parabolic spindle, they obtained the greatest strength, with the least dead weight, from a given quantity of material, combined with the greatest economy of construction. Placing their propeller in the center, transversely to the axis of the steamer (its hub, so to speak, being a drum of the same diameter as the latter), they were enabled to exert a greater and more uniform power in proportion to tunnage than had ever been employed before, and that was limited only by the character of the blades and the capacity of the engines. The plan of construction thus adopted, besides its original economy, would, it was believed, be attended also with economy in service; there being less dead weight to be driven through the water, with a smaller cross section, better lines, and less of that resistance which is occasioned by the hull and "top hamper" of ordinary sea-going propellers. While great speed might thus be anticipated, it was also supposed that it would be comparatively uniform—that, offering less resistance to the waves, the vessel would be less affected by them—that, instead of mounting and descending them, she would *pierce* them; and thus, having no occasion, even in the roughest weather, to "slow" her engines, her winter voyages across the Atlantic would be but little, if any, longer than her summer ones Looking to safety, it was evident that, being built altogether of iron, and having no woodwork in the shape of decks and interior joinery that might burn, such a vessel could be made altogether fire-proof; while the facility with which water-tight compartments, in any number, might be introduced, would lessen the risk of loss of life from collision, or even wreck, to a greater extent than had ever been accomplished. It was hoped, too, that the steadiness of the vessel, when at sea, in heavy weather, would go far to obviate one of the most disagreeable accompaniments of a voyage—sea sickness.

With the above-mentioned views, the Winans steamship was commenced; and on January 7, 1859, steam was first applied to the propeller. Since then she has been made the subject of constant and carefully registered experiments. On her first trial it became evident, from the wave at her bow and the furrow at her stern, that she was too blunt—that there had been an error in lessening the radius of the section of the spindle as it approached the extremities; the wave being where the change of curvature occurred. New ends were therefore constructed in lieu of the first, so as to give a uniform curve. The wave was now greatly diminished, and there was a large increase of speed. The ends were then further lengthened. This time there was no increase of speed, but the wave disappeared absolutely, and the vessel entered and left the water with scarcely a ripple even. The limit of improvement in this direction had evidently been reached. The true form of least resistance lay somewhere between the second and third lengthening of the vessel. The pitch, number and shape of the blades of the propeller became also the subject of experiment. Change after change was made with improved results. As the pitch became coarser, the economical effect was very strikingly improved. Further experiments in this regard are still in progress, and will be continued until, improvement apparently ceasing, the desired information shall have been obtained in this particular. The proper shape of the vessel and the best arrangement of the propeller, in its details, were naturally the most important considerations, and the experiments in regard to them have been most carefully made; the speed being measured by the buoys in the ship channel of the Patapsco and Chesapeake Bay, the distances between which were furnished to the Messrs. Winans by Professor Bache, the distinguished superintendent of the Coast Survey Office, and the experiments being repeated until no question existed as to the results. Experiments were also made with regard to every other matter which could in any way influence the plan of the larger vessel that the Messrs. Winans propose to build. While these were in progress, the predictions made by the scientific press and by the public, both in this country and abroad, were tested most satisfactorily, and all unfavorable opinions, without a single exception, were ascertained to be unfounded. Still, the action of the vessel in a heavy sea-way was yet to be ascertained; and hence the trip to Norfolk. Here the anticipations of the builders were fully realized. The varying action of the waves (which operate to produce rolling almost wholly by their friction upon a vessel having the same relation between the centers of gravity and rotation as this one) was apparently powerless to overcome the *vis-inertiæ* of the steamer, even when in the trough of the sea; and when she was moving across it, the advancing or retreating wave, penetrated by the pointed beak below its crest, seemed not to have sufficient power to lift the vessel forward, but, rolling for some distance over it, gave way, as it were, and settled down to the right and to the left, rising some three feet above the sleeve around the propeller, and elevating the steamer bodily upon nearly an even keel in proportion to the hight of the watery mass, without producing any apparent tendency to pitch. During these experiments, two life-boats attached to the chimneys, near their tops, afforded a resistance to the wind; and when the vessel was in the trough of the sea, with the wind "abeam," these boats caused a steady list to leeward, proportionate to the violence of the gale, but never exceeding 10 degrees in the heaviest gusts, and amounting, at other times, to less than five. But for the life-boats, there seemed to be every reason to believe that the list to leeward would never have exceeded that which was due to the pressure of the wind against the ventilator and chimneys. The steamer ran twice out to sea from Norfolk; and it was on the second trip that a gale from the northwest—coming unobstructed down the Chesapeake, and meeting the "ground swell" between Cape Henry and Cape Charles—afforded every opportunity to test the qualities of the steamer as a sea-going vessel. No variation in the movement of her engines was perceptible during the experiment; her speed was apparently the same throughout; she encountered the waves without any sensible concussion or shock; she was steered by one man at the wheel with great facility; and out of the many landsmen on board, not one was sea-sick!

So thoroughly satisfied were the Messrs. Winans with the result of their experiments that they determined to add 200 feet, amidships, to the length of the vessel, to fit it up as a saloon with state-rooms, to multiply the water-tight compartments, and to otherwise prepare her for the purpose—put her at once in passenger service on some established route, in which, of course, she must work her own way into public favor and reputation.

The parties who are equally interested in the experiments that have been made, and who are now engaged in carrying out the system, are Messrs. Ross and Thos. Winans, of Baltimore, and William L. Winans, of St. Petersburg, the result, after the original invention by the first two persons, is owing to joint discussion, in which no one has taken a more active part than the gentleman now in Europe, who has brought to the subject the suggestions of a large experience in all matters of scientific and practical mechanics, and a fund of collateral information only to be obtained abroad.

B.

## COAL TAR FOR TREES.

MESSRS. EDITORS:—It is stated, on page 370, Vol. I. (new series), SCIENTIFIC AMERICAN, that you have been assured by those who have tried the experiment, that coal tar is excellent for preventing animals from girdling fruit and other trees. I have a friend who was assured some years ago that it was good to prevent ants from climbing up such trees; this induced him to apply it with a brush to about 30 thrifty apple trees in the month of June. In a few days aftewards he had the mortification of seeing them girdled by it, more mechanically perfect than could have been done by either mice or rabbits! I think it nearly equal to *nitric acid* for trees and vegetables.

A. H.

Memphis, Tenn., Jan. 10, 1860.

[The above is important information and deserves further investigation. Why should coal tar act upon the bark of trees to remove it from the trunks in one case and not in another? Is it because it was applied hot in one case and cold in another; or is it owing to the peculiar period of the year when the sap was flowing free in one case and not in another? In the case of the person referred to by our correspondent, he lost 30 good fruit trees by the application of coal tar, which others have used with impunity. More practical information—facts derived from experience—is wanted on this subject.—EDS.

ST. LOUIS FUR TRADE.—This is an important branch of trade with the city of St. Louis, carried on with the western plains. The *Democrat* gives the receipts and the first cost of the furs received in that city last year as follows:—

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| 85,000 buffalo robes, $4 each, average | $340,000 00 |
| 125,000 coon skins, 65c. each | 81,250 00 |
| 37,000 mink skins, $1.60 each | 59,200 00 |
| 120,000 lbs. deerskins, 22½c. per lb | 27,000 00 |
| 10,800 wolf skins, 90c. each | 9,720 00 |
| 34,500 opossum skins, 18c. each | 6,210 90 |
| 1,100 otter skins, $2.75 each | 3,025 90 |
| 4,000 fox skins, 30c. each | 1,200 00 |
| 5,500 muskrat skins, 20c. each | 1,100 00 |
| 2,050 wild cat skins, 35c. each | 717 50 |
| Total | $529,422 50 |

To which we may add $20,000 for beaver, bear, badger, cross, red and silver fox, fishers, skunk or polecat, panther, martin, and other furs and skins. To this sum of $550,000, may also be added the trade of our dealers in furs bought in Arkansas and other localities, and shipped directly East without being brought to St. Louis. The smaller furs in the above list seek this market from Tennessee, Arkansas, Illinois, Missouri and other territory contiguous. There are also received large numbers of Indian dressed deer skins of considerable value. All the buffalo robes are dressed by Indian squaws, scattered over the great West. The Indian men or "braves" hold work in too great contempt to do anything more than shoot the buffalo; but the poor squaws must dress all those which are marketed. The number of robes is decreasing annually, not so much by the lessening of the immense buffalo herds as by the extinction of the Indian race, or the occupancy of their grounds by the whites. Some years as high as 120,000 robes are brought to St. Louis; usually about 110,000; but last year only 85,000, besides the buffalo calf skins, which are also quite numerous.

THE HORRORS OF BURNING FLUID.—That indefatigable inquirer into all sorts of mysteries, E. Merriam, states that, in the year 1859, he has recorded 83 deaths and the serious injury of 106 persons, all resulting from the use of burning fluids; while the loss of property by fire from the use of those vile compounds amounts to $44,000. The whole number of deaths since July, 1850, he records as 424; injured, 623. We long ago ordered this stuff out of our house, and we advise all our readers to do the same thing. Use coal oil, tallow candles, pine knots, anything rather than hazard life, limb, and property by the constant use of a dangerous burning fluid.

HOW TO PRESERVE LADIES' FURS.—Fine furs should be kept in a cold place. An experienced dealer will tell, the moment he puts his hand on a piece of fur, if it has been lying in a warm, dry atmosphere; it renders the fur harsh, dry and shabby, entirely destroying the rich, smooth softness which it will have if kept in a cold room.