A NEW AERIAL SHIP.

PREPARATIONS FOR A TRANS-ATLANTIC VOYAGE—THE AIR-SHIP "CITY OF NEW YORK."

[From the New York Daily Times.]

An experiment in scientific ballooning, greater than has yet been undertaken, is about to be tried in this city. The project of crossing the Atlantic ocean with an air-ship, long talked of but never accomplished, has taken a shape so definite that the apparatus is already prepared, and the aeronaut ready to undertake his task. Whether successful or not, the enterprise merits mention from its magnitude, and the energy and fertility of resource displayed in its prosecution.

The work has been conducted quietly, in the immediate vicinity of New York, since the opening of spring. The new air-ship, which has been christened the *City of New York*, is so nearly completed that but few essentials of detail are wanting to enable the projectors to bring it visibly before the public.

The aeronaut in charge is T. S. C. Lowe, a New Hampshire man, who has made 36 balloon ascensions. His last public appearance was at Portland, during this year's celebration of the Fourth of July. Since that time he has given his undivided attention to the perfection of the air-ship designed for his trans-atlantic voyage, and has devised various improvements in its construction, by which he claims to have overcome the more serious impediments to aerial navigation.

The dimensions of the *City of New York* so far exceed those of any balloon previously constructed that the bare fact of its existence is notable. The spot where its huge envelop is now undergoing the final process of oiling is an open piece of grass-land, four or five miles distant from the city. The profane have not yet been admitted to the knowledge of the mystery which surrounds the mighty heap of cloth and cord, and the jealous eye of a faithful watchman has kept at bay the inquisitive stranger. As remarkable events are prepared most carefully in the dark, so Mr. Lowe has reserved the surprise of this biggest of balloons until the last moment, when the immensity of its measurements can be palpably distinguished. Briefly, for so large a subject, the following are the dimensions:—

Greatest diameter, feet....................	130
Transverse diameter........................	104
Hight, from valve to boat..................	350
Weight, with outfit, tuns..................	3½
Lifting power (aggregate), tuns.........	22½
Capacity of gas-envelop, cubic feet....	725,000

The *City of New York*, therefore, is nearly five times larger than the largest balloon ever before built. Its form is that of the usual perpendicular gas-receiver, with basket and life-boat attached. The introduction of valuable improvements, however, leads to the conviction that its general arrangement is greatly superior. Mechanical power is to be applied; the aeronautic party will keep the cold away from their marrow by the use of a lime stove; a new arrangement of revolving fans has been devised; and the material of which the envelop is composed is covered with a peculiar varnish, the invention of Mr. Lowe.

Six thousand yards of twilled cloth have been used in the construction of the envelope. Reduced to feet, the actual measurement of this material is 54,000 feet, or nearly 11 miles. Seventeen of Wheeler & Wilson's sewing-machines have been employed to connect the pieces, and the upper extremity of the envelop, intended to receive the gas-valve, is of triple thickness, strengthened with heavy brown linen, and sewed in triple seams. The pressure being greatest at this point, extraordinary power of resistance is requisite. It is asserted that 100 women, sewing constantly for two years, could not have accomplished this work, which measures by miles. The material is stout, and the stitching stouter.

The varnish applied to this envelope is a composition, the secret of which rests with Mr. Lowe. Three or four coatings are applied, in order to prevent leakage of the gas. Mr. Lowe is daily engaged in the personal superintendence of the process of manufacture. We found him yesterday hard at work in an open field, assiduously testing the progress of certain gallons of a villainously-smelling compound, which boiled furiously at a temperature of 600°.

The netting which surrounds the envelop is a stout cord, manufactured from flax expressly for the purpose. Its aggregate strength is equal to a resistance of 160 tuns; each cord being capable of sustaining a weight of 400 or 500 pounds.

The basket, which is to be suspended immediately below the balloon, is made of rattan, is 20 feet in circumference, and four feet deep. Its form is circular, and it is surrounded by canvas. This car will carry the aeronauts. It is warmed by a lime stove, an invention of O. A. Gager, by whom it was presented to Mr. Lowe. A lime stove is a new feature in air-voyages. It is claimed that it will furnish heat without fire, and is intended for a warming apparatus only. The stove is one and a half feet high and two feet square. Mr. Lowe states that he is so well convinced of the utility of this contrivance that he conceives it to be possible to ascend to a region where water will freeze, and yet keep himself from freezing. This is to be tested.

Dropping below the basket is a metallic life-boat, in which is placed an Ericsson engine. Capt. Ericsson's invention is therefore to be tried in mid-air. Its particular purpose is the control of a propeller, rigged upon the principle of the screw, by which it is proposed to obtain a regulating power. The application of the mechanical power is ingeniously devised. The propeller is fixed in the bow of the life-boat, projecting at an angle of about 45 degrees. From a wheel at the extremity, twenty fans radiate. Each of these fans is five feet in length, widening gradually from the point of contact with the screw to the extremity, where the width of each is 1½ feet. Mr. Lowe claims that by the application of these mechanical contrivances, his air-ship can be readily raised or lowered, to seek different currents of air; that they will give him ample steerage-way, and they will prevent the rotary motion of the machine. In applying the principle of the fan, he does not claim any new discovery, but simply a practical development of the theory advanced by other aeronauts, and partially reduced to practice by Charles Greene, the celebrated English aeronaut. Mr. Lowe contends that the application of machinery to aerial navigation has been long enough a mere theory. He proposes to reduce the theory to practice, and see what will come of it. It is estimated that the raising and lowering power of the machinery will be equal to a weight of 300 pounds; the fans being so adjusted as to admit of very rapid motion upward or downward. As the loss of three or four pounds only is sufficient to enable a balloon to rise rapidly, and as the escape of a very small portion of the gas suffices to reduce its attitude, Mr. Lowe regards this systematic regulator quite sufficient to enable him to control his movements, and to keep at any altitude he desires. It is his intention to ascend to a hight of three or four miles at the start, but this altitude will not be permanently sustained. He prefers, he says, to keep within a respectable distance of mundane things, where he "can see folks." It is to be hoped his machinery will perform all that he anticipates from it. It is a novel affair through out, and a variety of new applications remain to be tested. Mr. Lowe, expressing the utmost confidence in all the appointments of his apparatus, assured us that he would certainly go; and, as certainly, would go into the ocean or deliver a copy of Monday's *Times* in London on the following Wednesday. He proposes to effect a landing in England or France, and will take a course north of east. A due easterly course would land him in Spain; but to that course he objects. He hopes to make the trip from this city to London in 48 hours; certainly in 64 hours. He scouts the idea of danger, goes about his preparations deliberately, and promises himself a good time. As the upper currents, setting due east, will not permit his return by the same route, he proposes to pack up the *City of New York* and return home.

The air-ship will carry weight. Its cubical contents of 725,000 feet of gas suffices to lift a weight of 22½ tuns. With outfit complete its own weight will be 3½ tuns. With this weight 19 tuns of lifting-power remain, and there is accordingly room for as many passengers as will care to take the venture. We understand, however, that the company is limited to eight or ten. Mr. Lowe provides sand for ballast, regards his chances of salvation as exceedingly favorable, places implicit faith in the strength of his netting, the power of his machinery, and the buoyancy of his life-boat, and altogether considers himself secure from the hazard of disaster. If he accomplish his voyage in safety, he will have done more than any air-navigator has yet ventured to undertake. If he fail, the enterprise sinks the snug sum of $20,000. Wealthy men, who are his backers, sharing his own enthusiasm, declare failure impossible, and invite a patient public to wait and see.

The precise time for the ascension has not been fixed. The ship is so near completion that the event will not probably be delayed beyond three or four weeks. Proper notice of the time and place will be given.

PRESERVING RAILROAD TIMBER.

Our attention has been directed to this very important question by a pamphlet sent to us by its author, Mr. F. Hewson, C. E. It is stated in this pamphlet that the renewal of the timbers of bridges and other superstructures of railroad tracks, is the most expensive item of repairs. The life of a "sill" seldom extends beyond eight years, and the rate of annual depreciation on bridges and other structures equally exposed to atmospheric influences, amounts to 12½ per cent. Upon 25,000 miles of railroad track in the United States, it is estimated that 3,125 miles of timber superstructure are renewed annually at an expense of no less than $3,500,000. The great question is, can this rapid depreciation be prevented by so treating railroad timbers that they will acquire the property of greater durability, and thus effect a great saving, not only in the cost of timber, but for the labor necessarily involved in removing the decayed, and putting in the new materials? The chief obstacle to the attainment of such a result is stated in Mr. Hewson's pamphlet to be the great outlay required in the outset, for the apparatus which is usually employed for such purposes. Thus in practicing the processes for treating timber, at Lowell, Mass., as described on page 93, Vol. XII, SCIENTIFIC AMERICAN, it is stated to be so inconvenient for railroads as to preclude its use. The apparatus for this process consists of a large iron tank, like a steam boiler, in which the timber to be impregnated is placed, the air exhausted by a pump, and the preservative solution then forced in under pressure. In the Kyanizing, Burnetizing, and Bethelizing processes, (so-called) similar apparatus may be employed; the above names are merely derived from those of the persons who patented certain solutions for treating the timber. Thus, Mr. Kyan used corrosive sublimate; Sir Wm. Burnet, chloride of zinc; and Mr. Bethel, pyrolignite of iron. Railroad timbers impregnated with any of these substances are used on most of the railroads in England, with very satisfactory results.

The laudable object of Mr. Hewson's pamphlet is to bring to the notice of railroad companies a very simple, inexpensive and convenient method of treating their timbers with antiseptic substances. It consists in placing them (railroad sill, for example) with their butt ends down in an open rectangular wooden tank, then filling it up to the top with a solution of the pyrolignite of iron. For sills seven feet long, a column of liquor of this depth expels the sap of the wood, and the preserving solution takes its place. A tank for treating 100 sills costs only $70, and it weighs but two tuns. It can therefore be easily transported from one station to another on a railway, whereas another expensive apparatus is fixed, and all the timber has to be taken to one locality for treatment. A number of experiments conducted in this manner have given satisfactory results. By immersing white, red, rock, and black oak, and chestnut and hemlock sills, for seven days, in a solution of one part of pyrolignite of iron to one of water, the average gain of the six specimens was 3·3 lbs. per cubic foot. Some specimens absorb their solutions more slowly than others, chestnut and hemlock require much longer steeping than oak. Some kinds of timber also absorb different substances in variable proportions. Thus while a stick of white oak gained 6·8 per cent in weight while steeped in a solution of chloride of zinc, 7·9 per cent in a liquid of blue vitriol, and 10·7 in pyrolignite of iron, a hemlock stick gained 9·7 in the chloride of zinc, 10·1 in the blue vitriol, and 7·6 in the pyrolignite solution. Heavy timbers, for bridges, were also treated in this manner, in a tank 27 feet deep, sunk in the ground, a hoisting crane being used to put in and take out the sticks. Timber freshly cut absorbed the solution readily, the sap being pressed out by the column of the pyrolignite. The process of Mr. Boucherie, illustrated on page 336, Vol. XII, SCIENTIFIC AMERICAN, is also illustrated in this pamphlet and favorably noticed, but it is principally designed for treating newly-felled trees in the forest, and is not so convenient for railroad purposes.