

THE GREAT EASTERN STEAM-SHIP.

The grand destructives of nature are the winds and the waves; their appointed business is breaking, grinding, and pulverising. Even the adamant-like rock of the sea-shore is changed by their pertinacious effort into incoherent and almost impalpable sand. But the power they can exert in their lawful task has, nevertheless, a narrow well-defined limit, which appears really to have been set within that of the antagonistic capacities of human ingenuity. Science can now accomplish what Canute of old shrunk from attempting. This fact was practically illustrated so soon as breakwater barriers and light-houses had been reared amidst the storm-surf of the ocean, which could stand firm while the violence of the hurricane raged remorselessly around them.

But is there anything in the mere necessities of buoyancy which tends to reverse this state of affairs? Is there any sufficient reason why floating-ships must occasionally be abandoned to the spirit of the ocean-storm, when claimed as its holocausts? So long as men were true to early tradition, and built their vessels of wood, there could be no doubt the winds and the waves must often prove to be too much for the resisting capabilities of the structure. Beams and planks could only be procured of a certain thickness, and these could only be attached together with a very limited amount of tenacity. The strongest mass of timber man could frame, proved to be as frail as a match in the hand of the tempest. When, however, abandoning these early traditions, shipwrights turned from the forest to seek their material in the mine—when they deserted wood for iron, and took to the hammer and the anvil in the place of the augur and the adze, the case was altogether changed. By the aid of the steam-hammer, ribs and plates can be forged of any dimensions and of any strength; and by the employment of red-hot rivets, these plates and ribs may be so attached together, that the lines of union have actually as much strength as if composed of solid material. The soundness of the work may be tested, too, at every stage by the Titanic wrench of the hydraulic-press, until perfect assurance is attained that no weak places are left in the fabric through accident. The first attempts at this novel kind of naval architecture, which was to endow dense iron with the properties of cork, proved to be failures in a great degree, as was to be anticipated. As in all other walks of art, it seemed that a certain degree of practice and experience was essential to perfection. It has generally been conceived that the ill-fated *President* steam-ship snapped across some Atlantic wave, as a match might be snapped between the fingers; the still more gigantic *Great Western*, *Himalaya*, *Atreya* and *Persia* have, however, since that unfortunate accident, continued to plough their ways in safety through the ocean storms. The *Great Britain* lay for months among the breakers of the rock-bound coast of Ireland, and yet finally floated off unscathed, to render good service to the British government as a transport in time of need. The grand experiment of the cyclopean order of naval architecture is, however, in preparation, and shortly to be put to the test. The Great Eastern Steam-ship Company have for some time been engaged in building an iron ship upon a scale, both as regards absolute dimensions and strength of material, that will at once change its leviathan predecessors into pigmies.

This future monarch of the leviathans is now so far advanced towards completion, being within thirteen months of its watery berth, that it has become a very interesting object. It stands upon the banks of the Thames, at Mill-wall, just opposite to Deptford. About 120 feet of the hull and deck are entirely finished in the midships; 200 feet more each way towards the bows and stern, have a skeleton of inner plates attached together, so that the general form and character of the structure are thus far obvious to the eye; but other seventy feet of both bows and stern remain yet 'baseless fabrics' of vision that the imagination has to fill up. Nevertheless, when the observer approaches the monster ark from the Horseferry Road, to which he is conveyed by the Blackwall Railway; he sees before him a huge wall surmounted by shears and other mechanical appliances for raising heavy weights, and stretching to a greater extent from left to right than the entire length of Ely Cathedral, being also within about ten feet of the height of that building! The first thought that arises to the mind on the contemplation of this vast structure is—if even it be happily floated upon the wave, how is its course ever to be controlled and directed? What human arm or arm will ever be able to wield and guide it? Who shall put the heidle round its mighty neck, and govern its movements with the rein?

Upon coming up close to the side of this iron monster on the strand, where it is growing under the influence of iron crystallisation, the ruling idea of its design at once becomes apparent. Along the middle portion, a slightly curved surface of lines, made up of plates studded with rivets, is presented to the eye. This is all smooth and neat, and finished off with paint of a pale leaden hue. Further on, the shell is rag-

ged and rusty, and without its external layer. This ship differs from all other vessels hitherto contrived, in having a double hull. There is an inner shell of plate-iron, two feet nine inches from the outer one, and these two shells are connected by strong intermediate ribs of iron, two feet nine inches broad and sixty feet long. In the lower part of the hull, these ribs are two feet nine inches apart; but they are farther asunder in the higher portion of the vessel, where less strength is required. The hull is thus really of a cellular construction. It is composed of a very great number of long chambers, wide enough for men to creep along in, between the inner and outer walls. These chambers are each bounded above and below by the connecting ribs, within and without by the double walls of the hull, and at each end by cross partitions, to be more particularly alluded to presently. If, in consequence of any accident, the outer shell of the vessel were broken or torn when the ship is afloat, the water would rush in, and find itself in one of these chambers; but it would then come in contact with another shell of equal strength with the external one, which would effectually exclude it from the true interior of the vessel. There could be no access to this interior, unless the strong ribs and the second inner shell were also broken away; even then, the water would still find itself entangled in new arrangements, intended to limit its powers of mischief, and no very great harm would result. But these arrangements will be best understood by glancing at them from another point of view.

Access to the upper-deck is gained by means of a broad wooden staircase, which doubles again and again upon itself, until the highest part of the iron shell is reached. A broad level platform of iron, exactly like the outer surface of the hull, and formed of rivet-studded plates, that extends beneath the feet. This platform is double, or cellular, like the hull already described. At the two extremities, fore and aft, the inner shell is seen extending further than the outer one, with some of its plates hanging fringe-like and shaking over the vacant abyss, just temporarily attached to their neighbors by nuts and screws, which are soon to be replaced by rivets. This deck has been planned to be of such strength, that if it were taken up by its two extremities when it is complete, and the entire weight of the vessel is ever intended to carry over hung upon its middle, it would sustain the whole by its unaided powers of resistance. The cellular hull is carried only about eight feet above what will be the water-line when the completed vessel is immersed and heavily laden. Then it runs up as a single hull, until it is attached above to the cellular deck.

The upper-deck runs flush and clear from stem to stern for a breadth of about twenty feet on either side, thus affording two magnificent promenades for the passengers just within the bulwarks. These promenades will be each rather more than the eighth part of a mile long. Four turns up and down either of them would exceed a mile by 256 feet. The vessel, when launched, will be more than as long again as the steam-ship *Great Britain*; it will be nearly three times as long as the line of battle-ship the *Duke of Wellington*, and nearly as long again as the *Himalaya*; eighty-eight feet more would make it as long again as the *Persia*, at present the longest vessel afloat upon the ocean.

Between the two side-promenades of the deck there are several quadrangular openings, edged with low iron bulwarks, and looking down into the deep recesses of the structure. These openings are forty-two feet wide, and nearly sixty feet long, and there are deck gangways, connecting the side-promenades, between each of them. Into these spaces the skylights of the large saloons for passengers will ultimately be fixed. Now, the observer on the deck looks down through them into the great cavities of the vessel, and vast indeed these cavities are. There are strong partition-walls of iron passing across from side to side of the long interior, at intervals of sixty feet. In one case only, the partitions are eighty feet asunder. These walls are constructed of strong iron plates riveted together so as to be entirely water-tight everywhere from top to bottom. The spaces between now look like large square tanks or wells. Into each of these tanks, an upper and a lower saloon, sixty or eighty feet long, forty feet wide, and as lofty as the most commodious drawing-rooms, are to be inserted, with a complete appendage of kitchens, offices and bed-chambers ranging along their sides. Every one of these systems of saloons and cabins will be entirely distinct from all its neighbors, and there will be no access from one to the other, except by openings situated high up near the deck. In this way, even if the water should effect an entrance into one of these compartments, it will remain imprisoned there, and all the other compartments will be as safe as before, and sufficient in themselves to keep the vessel floating above the waves. In all, there will be eleven distinct water-tight compartments in the ship, besides the almost innumerable water-tight chambers contained between the shells of the hull and of the decks. It is the transverse

partition-walls of the interior that constitute, by their continuance, the ends of these sixty feet long chambers. By means of all these partitions, small and large, with the addition of horizontal decks planted wherever floors and ceilings are required, the structure will be made inconceivably strong, just as the bones of animals are by the cancelled arrangement of their substance. Since the double-chambered deck alone has strength enough to bear the entire weight ever to be trusted in the ship, if it were used as a simple beam, it is anticipated that this multiplication of internal braces and supports will be sufficient to enable the hollow hull to resist, as a whole, very much more violence, and much heavier strains, than the elements ever can inflict upon it. But besides this, the water-tight character of the numerous compartments would necessitate, that several of them should be broken into simultaneously before the vessel could be sunk into the sea. The fair probability is, that the gigantic ship might be stranded upon rocks amidst breakers for months, without being broken up; and that if, after such adversity, it were ultimately floated off into deep water, with holes even through several parts of its double hull, it would still swim with only a foot or two of deeper immersion, a yet navigable and manageable whole. It could not sink to the bottom, until water enough had found its way into the internal chambers to make the entire mass a little heavier than an equal bulk of the saline fluid.

The huge iron fabric now stands upon 15000 piles driven deep into the loose ground. It is reared up from these three or four feet by a forest of wooden pillars, which allow workmen and curious visitors to pass on among them by stooping. Upon arriving under the centre of the mass, it is obvious that there is no keel, properly so called: a flat keel-plate of iron, about two feet wide and one inch thick, runs the entire length from stem to stern. This is the base upon which all the rest is reared, plates, and girders alike. It is the stoutest planking in the structure. The bottom and sides ascending immediately from this are made of plates three-quarters of an inch thick; the thinnest plates, planted above, where less strain will fall, are half an inch thick; the underlying girders and beams being of course considerably more massive. The entire fabric is built from below upwards, by adding plank and girder to plank and girder. The several parts are attached together by rivets about an inch in diameter. When the observer stands outside during the riveting-work, he sees all at once a little flaming star appear on the iron side; it is a blazing rivet, almost at a white heat, thrust through from within. Immediately two sturdy workmen attack it with alternate strokes of the hammer, until the red projecting peg is changed into a flat black button—a transmutation that is effected in less than a minute. Every distinct plate is moulded beforehand to the exact shape required by the situation it is to occupy. In a large shed close by, a full-sized section of one-half of the midships' hull is sketched out by lines upon the floor, and other lines of different colours are traced within the space included in these, in apparently inextricable confusion. These are all, however, gauges for the dimensions of the several parts of the structure, laid down upon mathematical principles, and perfectly intelligible to the initiated. Wooden moulds are first prepared from these gauges; and then the iron plates and ribs are accurately fashioned to correspond with the moulds.

RAILWAY PROGRESS.—The *Westminster Times* of last Thursday contains the following piece of Railway news, which will be read with much satisfaction:—

At last we are enabled to announce that contracts have been accepted by the Chief Engineer and Commissioner of the European and North American Railway, for the completion of the line from Shediac to this place.

A number of tenders had been handed in, three of which, from among the lowest, were approved of as follows, viz: First Section commencing at Point de Chene, thence to the 9 mile stake, including the Scadouck Viaduct, by Messrs. Walker, Rankin & Walker of Canada.

Second or Middle Section, by Mr. Wm. Stevens, formerly Manager of the late firm of Messrs. James Sykes & Co.

Third Section, including Hall's Creek Bridge, by Mr. John Brookfield, the late well-known Contractor of the St. Andrew's and Quebec Railroad.

These Contractors we believe are men of experience and high standing as Railway Builders, and we have been assured that it is the determination to proceed with the work forthwith, and this being the case we hope now to see matters progress rapidly to a conclusion of which we think there is at length a reasonable prospect.

A fire broke out at St. John's N. B., in Ritchie's tannery, near the "Golden Ball," which entirely consumed nearly twenty buildings in the neighborhood before it was arrested, besides partially damaging others. The loss has fallen severely upon several industrious and worthy mechanics, whose establishments have been totally destroyed. We deeply sympathize with the sufferers.—Another fire occurred in the afternoon, in a house belonging to J. Dody, on the corner of Germain and St. James streets. It originated from a spark falling on the roof. The building was much damaged.

HASZARD'S GAZETTE.

Wednesday, August 20, 1856.

The history of the public amusements of nations, and the causes and circumstances which gave rise to them, would, if well and philosophically written, form an entertaining and instructive work. Among the ancients, there were some in which the providing of games and pleasures for the people, were matters of state policy, and this in the height of their power and prosperity. The Olympian Nemean and Isthmian games are familiar to every classic reader. So famous and important were the first, that their quadrennial celebration became a measure of time, and historians relate a fact as having happened during the tenth or twentieth Olympiad with as much certainty of being understood by all the civilized world, as every modern writer with us, could, by giving the date of the year with the utmost exactness.

There is a species of public amusement, deservedly in repute with a nation whose national power whether military or commercial is the first in the world, which is known by the term "regatta;" why we should have borrowed the term from a foreign vocabulary, is among those anomalies into which we have not now time to enquire. Boat races have long been favorites with the British people or their descendants in every part of the world, so that when you hear of a horse race or a regatta, you may be certain that an Englishman or an Anglo American is at the bottom of it. We were pleased therefore to see the advertisement for this species of relaxation from the severity of labor for many reasons. Our insular situation will necessarily force us to be a commercial community whether we wish it or no, and it is therefore but natural, that we should take a pride in fostering a taste for a pursuit so essential to our well-being and comfort. We have need of good sailors and good ships and these annual contests will do much towards creating and keeping up such a taste. We state these few remarks on the morning of the regatta, and shall reserve any further comments until we see how the affair comes off.

It may be a vulgar weakness, and if so, we own the soft impeachment as Mrs. Malpross says, but nevertheless we do enjoy a crowd of well dressed comfortable looking men, women and children, leaving care and weariness aside for the moment, and determined to enjoy themselves. And we were gratified to our hearts content. We will undertake to say, that Charlottetown never on any occasion had so many people together as were congregated in its streets, wharfs and other places yesterday. The day was fine with the exception of a shower or two, which set the ladies scampering in search of shelter and produced a race not mentioned in the programme, and not the least attractive, for the crafts were all well rigged, and not a few of superior build; and flags, pennants and streamers when the squadron was in full sail presented a remarkably gay appearance. The wharfs were crowded, and in every place available for a sight was eagerly seized upon. Of the different races, and the manner in which they came off, as the phrase is, we do not profess to be sufficiently skillful to pronounce with certainty. The four cored zig race attracted our attention as being the best contested. We shall give the results as obtained from the Stewards. On the whole we were highly pleased, and this chiefly because all people were pleased, and because comparing the gathering of yesterday with those of past years, it gives us a high degree of satisfaction to find that a sensible improvement has taken place in the condition of the people. Healthy good looking and evidently well fed, the whole assemblage furnished an aspect that was highly cheering, and any intelligent stranger would have at once concluded that the country that could turn out such a population, is one that abounds with the necessities and comforts, as well as a fair proportion of the luxuries of life.

His Excellency the Lieut. Governor visited Georgetown on the 13th instant, while her Majesty's Brig *Arct* was in that harbor. The people in that vicinity took occasion to present a congratulatory address to His Excellency on his recent elevation to the honor of Knighthood.

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