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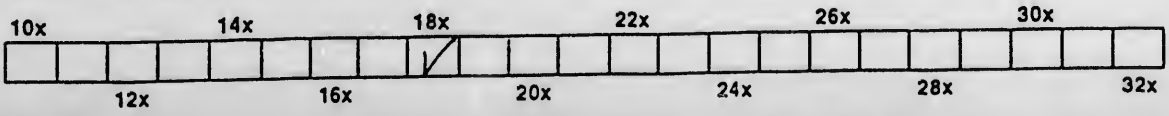

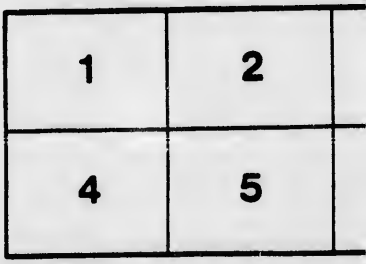

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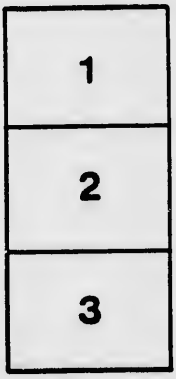

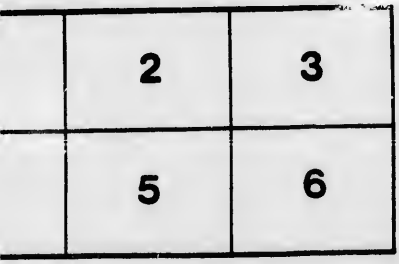

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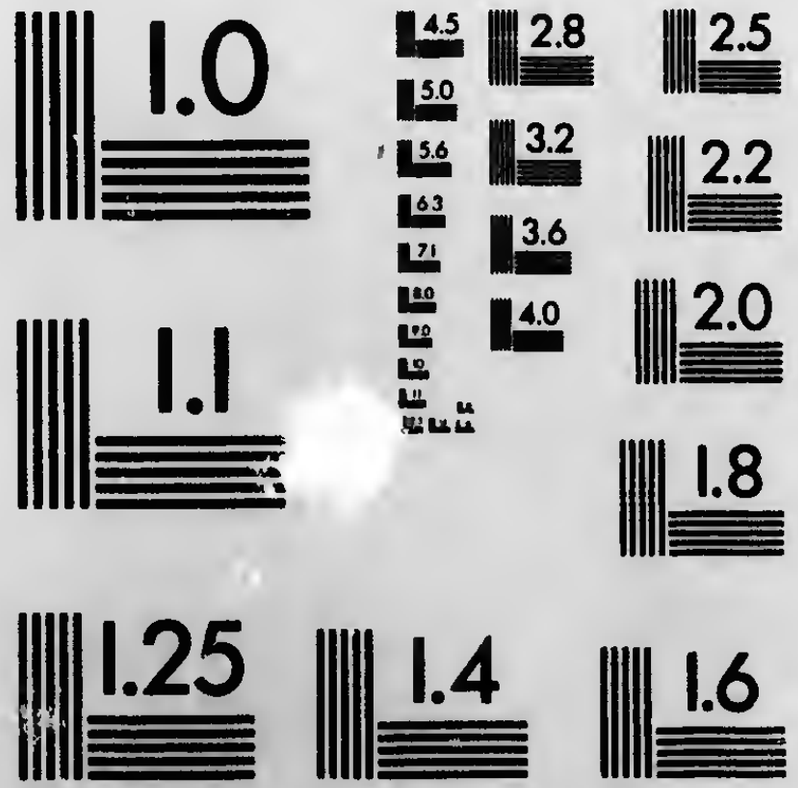

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7

An Account

OF

'THE GREAT EASTERN,"

(The Largest Steamship in the World),

BELONGING TO THE

EASTERN STEAM NAVIGATION COMPANY.

Designed by Isambard Kingdom Brunel, Esq., F.R.S., F.R.G.S., F.G.S. Ship and Paddle Engines, building by Messrs. John Scott Russell, & Co., at Millwall; and the Screw Engines, by Messrs. James Watt & Co., at Birmingham.

In placing before our readers what we believe to be the fullest and most accurate description of the Leviathan steamship, or as she is popularly called "the big ship," now building in London, we shall avail ourselves of the substance of a document placed before the shareholders by the directors in August, 1853, and a report from I. K. Brunel, Esq., to the directors, dated February, 1855, which has been dedicated to his Imperial Majesty Napoleon III, the Emperor of the French, and privately circulated. To this we shall add the fruits of a personal visit to the ship within the last few days.

This vessel, which is not yet named, though it is rumoured that she is to be called "The Great Eastern," is, without comparison, the largest and most powerful steamship in the world, as will be seen by the facts and figures we shall lay before our readers.

It may be needful to say that the vessel is the property of the Eastern Steam Navigation Company, which is incorporated by royal charter, limiting the liability of shareholders, as in Railway Companies. The capital of this Company is £1,200,000, in £20 shares, with power to increase the sum to two millions sterling. £8 10s. per share has already been called, and future calls can only be made at intervals of three months, and not exceeding £2 10s. per share; the shareholders receiving four per cent. per annum on their respective calls,

until the vessels of the company commence sailing. The company is under the following management:

COURT OF DIRECTORS.

Chairman—Henry Thomas Hope, Esq., of Picadilly, and Deepdene, Surrey.
S. Baker, Esq., Leadenhall street, and Thorngrove, Worcester.
Hon. F. H. F. Berkeley, M. P., Victoria Square.
E. Ladd Betts, Esq., Great George street, and Preston Hall, Kent.
J. St. George Burk, Esq., Porchester Terrace.
R. J. R. Campbell, Esq., Moorgate Street.
Captain R. Michael Laffan, R. E., M. P., St. James Street, and Otham Lodge, Kent.
Robert M'Calmont, Esq., Philpot Lane, and Eaton Square.
P. W. S. Miles, Esq., King's Weston, and Bristol.
Albert Robinson, Esq., Whitehall Place.
J. E. Stephens, Esq., St. James' Place.
C. R. M. Talbot, Esq., M. P., Cavandish Square, and Margam.

Engineer—I. K. Brunel, Esq.
Bankers—Messrs. Glyn, Miles, & Co.
Auditors—W. W. Cargill, Esq., and J. E. Coleman, Esq.
Solicitors—Messrs. J. C. and H. Freshfield.
Secretary—John Yates, Esq.
OFFICES—13, Gresham street, London.

The "Great Eastern," if we presume to call the leviathan steamship of which we speak by this name, was designed by Isambard Kingdom Brunel, Esq., F.R.S., F.R.G.S., F.G.S., &c., &c. The ship and paddle Engines are building by Messrs. John Scott Russell & Co., at Millwall, Poplar, and the screw engines by Messrs. James Watt & Co., Soho, Birmingham. The principal dimensions of the ship, her capacity and power, are as follows:

	Feet.
Length	680
Breadth	83
Depth from deck to keel	60
Length of principal saloons	400
Height of ditto	15
Number of decks	4
Tonnage	22,500 tons.
Carries of coals and cargo	18,000 "
Nominal horses' power ..... Screw,	1,600 horses
Ditto ..... Paddles,	1,000 "
Cylinders for paddle engines	4
Diameter of cylinders in inches.	74
Length of stroke	14 feet 6 in.
Draft of water (loaded)	28 feet.
" (light)	20 "
Carries of first class passengers	600
" second class "	1,800
" troops, with field equipments	10,000
Weight of iron used in the construction of the ship	10,000 tons.

It will be evident that such a ship as this, the first of a series, as would appear from the prospectus of her owners, must be unique in every respect. But before we speak of the peculiarities of her construction, it will be advisable to name the trade for which she was designed, and the reasons which induced so large dimensions. The court of Directors say in their report:

The navigable distances from Land's End to Port Philip are as follows, viz:

	Miles.
Via the Cape of Good Hope	11,819
" Cape Horn	12,700
" Gibraltar, Malta, Alexandria, Aden, Point de Galle, and Singapore, including transit through Egypt	12,034
" Panama, including transit across the Isthmus	12,678

It thus appears *that the ocean route to the focus of Australian connexion with Europe, is the direct route,* and it is also the route which has the advantage of being free from tolls, and the expense and delay of transhipment, and that it will be impossible for a smaller class of ships, by any route, to make the voyage to Australia in so short a time as your vessels.

It will therefore appear that Australia and India are to be the ports to which this ship is intended to sail. The distance to Australia and back, in round numbers, may be stated at 22,500 miles, which, though not quite exact, will show the principle which has governed the magnitude of the ship. We have had many trials and large experiences in steam navigation, and the result has proved that the size of the ship (when steam is used) must be in proportion to the length of the voyage. In examining this subject, Mr. Brunel has arrived at the conclusion that the best established steam-ships, such as the Cunarders for example, are of the proportion of one ton register to one mile's steaming. Therefore, calculating the voyage to Australia and back at 22,500 miles, he has designed a ship of 22,500 tons burthen, or a ton burthen for every mile to be steamed. And carrying out the experience of other companies in coaling, he expects to realize the same result on a large scale which has been proved on a smaller one, and that thus he can coal the ship for the voyage out and home at the lowest price of fuel, save the time hitherto lost in long voyages in calling at ports by the way, make a direct run for his destination, and realize a profit to the shareholders. On this point also the directors speak. They say to the shareholders—

The conditions indispensible to expeditious and regular steam voyages from England to Australia or India, which your ships are calculated to fulfil, will be—

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Respectfully call the attention of the Ladies to the following Departments, which are being constantly replenished with the latest Novelties:

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A choice assortment of Parisian Styles in Bonnets, Caps, Head Dresses, Ladies' Hats, French Flowers, Feathers, Plumes, &c.

MANTLES.

Parisian and London Shapes, in every new material, both in Black and Colours.

SHAWLS.

Barège, Tissue, Grenadine, India, China Crèpe, Cashmere, Paisley, &c.

SILKS.

Coloured Glacès, Shot Silks, Plaid and Check Silks, Flounced Silks, (very rich), Moire Antiques and Poplins, Black Glacè, Gros Royal, Ducape, Barathea, &c.

LACE GOODS.

Real Thread Laces.		Lace, Habit and Collar sets.	
Maltese	"	Maltese and Honiton	"
Honiton	"	Valenciennes & Limerick	"
Egyptian	"	Real Thread	"
Saxony	"	Spanish Crochet	"
Wove Thread	"	Jacquard and Bugled Laces.	
Valenciennes	"	Jacquard and Chantilly Veils.	
Limerick	"	Grenadine and Real Thread Veils.	

SEWED MUSLIN GOODS.

Book and Cambric Insertions.		Guipure Collars, Sleeves and sets.	
" " "	Edgings.	Eugenie Collars	" " "
" " "	Flouncings.	Babies' Bodies.	
" " "	Collars.	"	Frocks.
" " "	Sleeves.	"	Trains.
" " "	Sets.	Ladies' Caps.	
" " "	Habit Shirts.	"	Corded Skirts.
" " "	Chemizettes.		

Hooped Skirts and Ladies' Underclothing in great variety.

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1. That they shall not be obliged to stop at any place by the way to take in coal, stoppages for coal not only causing great delay by the time required for coaling, but compelling the vessels to deviate widely from the best route, in order to touch at the necessary coaling stations. Existing steam-ships have generally lost from twelve to twenty days in this manner, and so extended the duration of their voyages nearly to the time occupied by fast sailing vessels, thus incurring the cost of steam without securing its advantages.

2. In avoiding the delay of coaling on the voyage, your ships will also escape the great cost of taking coals at a foreign station. Coals obtained on the Indian and Australian route cost on the average, including waste and deterioration, four or five times as much per ton as in this country. But your ships will take their whole amount of coals for the voyage from near the pit's mouth, at the rate not exceeding, for the best quality, 12s. to 14s. per ton. On the voyage of existing steam vessels to Australia or India and home, the consumption amounts to from 4,000 to 6,000 tons, the cost of which would supply 15,000 to 20,000 tons, if taken on board at some port in immediate communication with the coal field.

In conjunction with distance and tonnage is speed, which Mr. Brunel estimates at fifteen knots an hour on the whole voyage, without diminution and without cessation, under any weather; a speed which would reduce the voyage between England and India, by the Cape, from thirty to thirty-three days, and between England and Australia thirty-three to thirty-six days.

Another and a very important consideration in reference to this ship is profit. For ourselves, we must confess that we are unable to form an opinion sufficiently definite; and therefore we append the sanguine opinions of the directors on this subject. But we would observe that the earnings of the ship might be largely increased by setting down and taking up passengers on the way,—say at Lisbon, Maderia, the Cape, and such other places as might be deemed advisable, which could be contrived by means of small attendant steamers at the different ports, and without any appreciable loss of time in the entire voyage. However, it is better the directors should speak for themselves on this point. It will be observed they make their calculations without reference to stoppages, and certainly their arguments are of a very striking character. They say:

Your directors would have refrained from publishing any thing like estimates, but having to meet the predictions of failure made by those interested in the present class of vessels, they think it right to state that the result of their calculations (made on the assumption that the carrying capacity for goods outwards should be occupied at the rate of £4 10s. per ton, being considerably below present freights, and only

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We invite particular attention to our Stock of

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for gentlemen's wear. In connection with this department we have a FIRST-CLASS CUTTER, whose experience qualifies him to suit all who may favour us with their orders. As we make quality of material and workmanship the basis of our charges, we feel satisfied that none can compete with us in this department.

READY-MADE CLOTHING.

Boys' and Youths' Coats in every size, material, and style.
do. do. Vests and Pants, do. do.
Men's Business Coats, Dress and Frock Coats, all prices.
Men's Tweed, Melton, and Silk Warp Coats, do.
Men's Check and Light Summer Pants, do.
Men's Black Dress Pants, Kersey and Doe Pants.
Men's do. Vests, Kersey and Broad.
Men's Light Summer Vests in every material.

We call particular attention to our Stock of Ready-made Clothing; all of which is made of selected material, and the workmanship warranted.

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Boys' White Shirts, Linen Fronts.
Men's do. do.
Men's Fancy Regatta Shirts.
Men's Collars, all new shapes.
Men's Merino and Spun-Silk Vests.
Men's do. do. Drawers.
Men's Cotton, Merino, and Lisle Thread Socks.
Men's Gloves—Kid, Lisle Thread, and Transverse.
White Linen Pocket Handkerchiefs.
Printed Bordered do.
White China Silk Handkerchiefs, Twilled and Plain.
Coloured India Silk do. do. do.
Ties, Scarfs.
Aërial and Napoleon Cravats.
Silk and Satin Scarfs.
Braces and Belts.
Umbrellas and Carpet-Bags.
Hats and Caps.

KYNDER & CHARLESWORTH,
32 & 34, King-Street East, Toronto.

one-half of the cabin room occupied, at rates for *first*-class passengers, £65; *second*-class, £35; and *third*-class, £25; including provisions, giving to each of the respective classes enlarged accommodation, and assuming that only one-third of the vessel's capacity would be occupied on homeward voyages) is, that, after making the most ample allowance for working expenses, depreciation, wear and tear, and insurance, a surplus remains equal to 40 per cent. per annum upon the capital invested. With these prospects based on sound commercial principles, this company requires no government assistance; all that is necessary is, that no rival route or rival company shall be subsidized to your prejudice.

Such were the views and considerations which led your directors to make their final arrangements. They believe, as they have before stated, that every company and every individual engaged in steam navigation has gradually become convinced by experience of advantage of size, and, so far as their opportunities and means enable them, are applying the principle, but only by small steps, being in a great degree controlled and limited by their existing establishments, and are acting only on the general view that large ships can be worked cheaper, and that large steamboats especially can attain much greater speed and certainty than small.

Mr. Brunel in his report speaks first of all of the modes of launching the ship, a subject of great importance, considering the dimensions and weight of the vessel, and the narrow and shallow river in which she is to make her first acquaintance with the waters of the sea. The intelligent and well-expressed conclusions of Mr. Brunel as to the mode of launching are thus stated:

One of the first points to be decided was the mode of launching the vessel, which, of course, would determine the position in which it was to be built; and I wish to take this opportunity of explaining my reason for adopting the plan I have decided upon, which, being unusual, might be supposed to be unnecessary.

Vessels are generally built above the level of high water, and then allowed to slide down an inclined plane into the water; occasionally (as in the case of the Great Britain) they are built in a dry dock, into which the water is afterwards admitted, and they are floated out.

Both plans were well considered in the present case; but the size of the dock required, the difficulty of finding a proper site for such a dock, and the depth required for floating a ship with her engines and boilers, which it was most desirable to introduce while building the hull, and the depth of channel required to communicate between such a dock and the deep water of the river, all combined to render the dock plan a very expensive, and, considering the nature of the soil in which it would have to be formed, a somewhat hazardous proceeding. Launching seemed to offer the fewest difficulties and the greatest certainty, but the dimensions of the vessel required some modifications of the usual modes of proceeding.

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of the Province of Canada their immense Stock of

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and beg to assure them that it will be their constant aim to secure the approval of all by a strict attention to the wants and requirements of their customers.

Relying on the principle of "Small profits and quick returns," they feel confident that a discerning public will appreciate their efforts to provide them with

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All who study real economy should remember that none but superior goods can be cheap at any price,—and one trial is solicited to prove the truth of the statement.

The extensiveness of their arrangements enables them to supply the demands not only of the Aristocracy, but also of the Middle and Working Classes; and no effort will be spared to merit the approbation of all their friends.

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Launching is generally effected by building the ship on an inclined plane, which experience has determined should be at an inclination of about 1 in 12 to 1 in 15, the keel of the ship being laid at that angle, and the head consequently raised above the stern say 1-15th of the whole length of the ship. In the present case this would have involved raising the forepart of the keel or the forefoot about 40 feet in the air, and the forecastle would have been nearly 100 feet from the ground; the whole vessel would have been on an average 22 feet higher than if built on an even keel.

The inconvenience and cost of building at such a great height above ground may be easily imagined; but another difficulty presented itself which almost amounted to an impossibility, and which has been sensibly felt with the larger vessels hitherto launched, and will probably ere long prevent launching longitudinally vessels of great length. The angle required for the inclined plane to insure the vessel moving by gravity being, say 1 in 14, or even if diminished by improved construction in ways to 1 in 25, is such that the end first immersed would become water-borne, or would require a very great depth of water, before the fore part of the ship would even reach the water's edge. Vessels of 450 or 500 feet in length would be difficult to launch in the Thames, unless kept as light as possible; but our ships could not be so launched, the heel of the sternpost being required to be, as I before said, about 40 feet below the level of the forefoot; some mitigation of the difficulty might be obtained by an improved construction of the ways, but the great length of ways to be carried out into the river would under any circumstances be a serious difficulty.

These considerations led me to examine into the practicability of launching or lowering the vessel sideways; and I found such a mode would be attended with every advantage, and so far as I can see, it involves no countervailing disadvantages. This plan has been accordingly determined upon, and the vessel is building parallel to the river, and in such a position as to admit of the easy construction of an inclined plane at a proper angle down to low water mark.

In constructing the foundation of the floor on which the ship is being built, provision is made at two points to insure sufficient strength to bear the whole weight of the ship when completed. At these two points, when the launching has to be effected, two cradles will be introduced, and the whole will probably be lowered down gradually to low water mark; whence, on the ensuing tide, the vessel will be floated off. The operation may thus be performed as slowly as may be found convenient; or if, upon further consideration, more rapid launching should be thought preferable, it may be adopted.

Another point of equal consequence in relation to this ship is touched upon by her designer, namely, the mode of getting at the vessel in all parts after she is launched. It is a well-known fact that iron ships "foul" very much, especially in warm climates and in still water, and if an iron ship makes a long voyage, say to Australia or India, it is absolutely necessary to lay her aground, on her return, for the purpose of cleansing the vessel's hull from grass and barnacles, and repainting her.

It was therefore natural that we should inquire how this essential duty was to be accomplished, and how in case of a fractured plate the evil was to be remedied. Mr. Brunel answers this question thus:

I hope to be able to arrange that the machinery which is to be provided by the contractor, for lowering the vessel down the ways, will be also fitted to form a "patent slip" arrangement for hauling the ship up for repairs; so that, if it should be found desirable to do so, such apparatus may be purchased for that purpose, and fitted up at the port which the ship will frequent. With the view of faciliating such an operation, or the grounding of a ship on a gridiron, for examination, at low water, a sufficient extent of the floor of the ship is formed perfectly flat, and is so strengthened as to allow the ship, when loaded, being grounded without being unduly strained.

The next point to be considered is the progress of the work. The Great Eastern is not a mere theory, but an actual fact. The work is really and rapidly progressing, and should no unforeseen obstacles arise, it is expected that the ship will be launched this summer, 1857. A deal of time was necessarily expended in making suitable preparations for the work, and erecting the machinery in the builders' yard for shaping, punching, planing and cutting the plates, and for bringing so large an undertaking into working order. The first plate was laid in May last, and at the present time 500 men are at work upon the ship in all departments. Unlike other vessels, the keels of which are laid and the framing erected therefrom and plated over, the "Great Eastern" is building in sections, the midship section being first built up to its full altitude, and the iron decks laid, and the other sections, fore and aft, being successively built in like manner, and joined to the preceding section. A number of these sections are built, the model of the stern post is erected, and the riband, or outline of the after part of the ship, is already put on.

In her external appearance, drawing the inference from the working model, we should say the Great Eastern will be a sightly ship. She is moulded with very fine lines forward and aft, and she will have an eliptical stern.

Her deck is to be flush, except for cabin entrances and similar purposes, so that a promenade more than twice the length of the Great Britain's deck will be available for the passengers on board this ship, and which, from her great size, ought at all times to be free from shipping water.

Intimately connected with the appearance of the ship is her rig, and, added thereto, her motive power. In no ship we know has the theory of chances been so fully studied as in the

"Great Eastern." We will enumerate these, and explain those which require it presently. Her chances may be stated thus:—

1. An inner and outer skin.
2. Water tight bulk heads.
3. Ample masts and sails.
4. Paddle wheels.
5. A screw propeller.
6. Steering apparatus.

Of these details, let us first consider the motive power, which is wind and steam, and afterwards we will describe the peculiar construction of the ship, so far as words can be made into pictures.

In the motive power, then, we have the wind, to avail itself of which the "Great Eastern" will have five masts, the three centre masts being crossed by yards as in a line-of-battle ship; the other two masts, one in the bow and one in the stern of the ship, will be smaller in size "for fore-and-afters."

Then, again, we have the steam power, namely, the paddle-wheels and the screw. We have before stated the nominal power of the engines, which, by the way, is far below their actual power, and we have also given the names of the makers. These engines, it is needless to say, are incomparably larger than any hitherto made. They willl be placed in different parts of the ship, and will be entirely independent of each other. The vessel will have ten boilers and five funnels, or, as the American calls them, "smoke pipes." Every boiler can be cut off from its neighbour, and used or not, as desired. They will be placed longitudinally along each side of the ship, and it will give some idea of their generative power when we say that every boiler will have ten furnaces; thus giving to the whole no less than 100 furnaces. The kind of boiler to be used has been decided upon, but not before an experimental boiler was made. The coal to be used is anthracite.

The vessel will have two paddle-wheels in the usual manner, but the paddle-engines are to be on the disconnecting principle, so that they may be used jointly or separately, and both or either paddle-wheels can be put in independent motion. Great anxiety has been felt as to the diameter of the paddle-wheel, which at present has been fixed at sixty feet. There are few points connected with a paddle-wheel steamer more important than the diameter of the wheel, six inches, more or less, in many cases, altogether changing the character of the vessel. A consideration of the light and heavy draft

of water of this ship will show the real difficulty in the way of the designer. The vessel, according to the table given above, must draw eight feet less when light than when she is loaded, and the great lift of water at the deepest immersion of the wheel is, in itself, an important consideration. Mr. Brunel reports on this branch of the subject in these terms:—

The position of the paddle shaft and the diameter of the paddles have been questions of some difficulty. It being necessary to provide for a considerable variation in the draft of water, though not proportionably so great as with many existing large steamers, and to balance well the relative advantages of securing the highest average speed, at all the various drafts, or the highest speed at a light draft, and to combine as far as possible the two, so that the vessel may be as well adapted to perform comparatively short and very quick passages to ports not affording a great draft of water as long voyages heavily laden, at a moderate maximum, but still a large average rate of speed. Although the full advantage of the great capacity of the vessel for carrying coal for long voyages would not be felt in a voyage, for instance, to New York, or in any other short voyage, yet, unquestionably, she would exceed all other vessels in speed and in accommodation; and if it should be found desirable to make such voyages, your vessels ought to be able to command almost a monopoly by their superior capabilities, and I have therefore endeavoured so to place the paddle-shaft, and so to construct the paddle-wheels, that they can be adapted to the convenient application of the full power of the engines at a light draft of water at a very high speed.

The screw propeller is to be 23 feet in diameter.

The ship will be steered by two rudders, which, from their power, ought to bring her quickly round. The upper rudder, as we may call it, is made like a ship's rudder. The screw works at the foot of this rudder, but quite clear of it, and below the screw is a second rudder, in form something like an ordinary rudder, placed lengthwise.

It will thus appear that, in case of accident, this ship has many unusual chances. She has her sails, her paddle-wheels, separately or in conjunction; her screw, and two rudders. We should add that each engine-room is forty feet long.

We come now to describe the principle of construction. The ancients have given us the gender of a ship. They called a ship "she," and "her," intimating thereby that one ship was the mother of others. Perhaps these remarks may explain the character of the ship of which we speak, for she is literally a ship—a ship within a ship—a double ship. If the reader will imagine a ship built of any size, and then a smaller ship built and placed in the larger one, he will form some idea (though not a full one) of the "Great Eastern."

Perhaps the best terms to describe these inner and outer ships is to call them the outer and inner skins. The distance between the outer and inner skin, or ship, is 2ft. 10in. The floor of the ship, as previously stated, is perfectly flat, the keel being turned inwards and rivited to the inner ship's keel. These several skins are joined to each other by longitudinal webs or girders, formed of plate and angle iron. There are seventeen of these webs on each side the ship, which run the entire length of the vessel, and they are placed at such distances as to extend upwards, at intervals of about 3ft. from the keel to the main deck, and they are again closed up in lengths varying from 20 to 60ft. Thus the outer and inner ships are joined together by means of a great number of water-tight webs or cells, of extraordinary strength, giving the vessel a rigidity such as has never been communicated to a ship before. The main deck is treated in the same manner for a width of 20 feet on each side, and iron girders bind one side to the other, so that the entire vessel becomes, as it were, a beam of strength, and the whole fabric may be denominated a web of woven iron, the rivets forming the fastenings, and the webbed or honey-combed cells becoming an indissoluble structure. The compartments between the outer and inner skin will hold 3,000 tons of water ballast, should it be required. The web plates are of inch iron, and the outer and inner skins are of three-quarter inch iron.

The vessel will have twenty ports on the lower deck, each five feet square, to receive railway waggons. She has also sixty ports on each side, two feet six inches square, for ventilation, and an abundance of dead lights. The lower ports are ten feet above the water when the ship is loaded.

In addition to these safe-guards outwardly the vessel is divided transversely by fourteen separate water-tight bulk-heads, running up to the main deck, and these again are crossed by longitudinal bulk-heads running fore and aft at about forty feet in width. It may therefore be said that the ship consists inwardly of a great number of small cells, or water-tight compartments, between the outer and inner skins, and of a number of large square compartments in the body of the vessel. The cabins will be on the decks, above these compartments, and opened out in long saloons.

Mr. Brunel further says in his report:—

The whole of the vessel is divided into perfectly water-tight compartments, by bulk heads carried up to the upper deck, and consequently far above the deepest water lines, even if the ship were water-

logged, so far as such a ship could be; and these being not nominal divisions, but complete substantial bulk-heads, water-tight, and of strength sufficient to bear the pressure of the water, should a compartment be even filled with water, so that if the ship were supposed to be cut in two, the separate portions would float, and no damage, however great, to the ship's bottom, in one or even two of these compartments, would endanger the floating of the whole, or even damage the cargo in the rest of the ship, or above the main-decks of the compartment in question; and all damageable cargo would be stowed above that deck. Besides these principal bulk-heads, there is in each compartment a second intermediate bulk-head, forming a coal bunker and carried up to the main-deck, which can on an emergency also be closed. There are no openings under the deep water line through the principal bulk-heads, except one continuous gallery or pipe near the water line through which the steam pipes pass, and which will be so constructed as to remain closed, the opening being the exception, and the closing again being easy; and the height being such, that under the most improbable circumstances of damage to the ship, ample time would be afforded to close it leisurely, and to make it perfectly water-tight. I have also adopted the system, to be followed rigidly, and without exception, of making no openings whatever, even by pipes and cocks, through the ships's bottom, or through the inner skin below the water-line, and I attach much importance to this system.

In the majority of cases in which steam vessels are compelled to put into port from failure of bilge-pumps and other really trifling defects, no such serious consequences would have resulted, but from the difficulty and almost impossibility of remedying at sea any defects in the numerous pipes and openings now carried through the ship's bottom wherever convenient, and without much regard to the danger of doing so.

I have found no great difficulty in carrying out this system completely; and the advantages, both as regards safety and the facility of remedying defects, without occasioning delay on the voyage, must be obvious.

It is an interesting study to observe the progress of steam navigation during the past twenty years. We were content then with small steamers to convey us to Ireland or Scotland. Then we got to the Great Western, and other vessels, to communicate with New York. Then we got the best managed, best manned, and most successful line of ocean steamers afloat, the Cunarders. Then we came to the greater magnitude of the Great Britain and the Himalaya. And now we have another rapid stride in the Great Eastern. Whatever may be her result as to her owners, is not our province to anticipate, but we say, with confidence, she is the wonder of the day, and she will, in all probability, revolutionize ocean st[illegible] navigation.—*Liverpool Courier.*

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