appears more to have arisen from a desire to prove that spring-felled timber was not unequal to winter-felled, than for the purpose of eliciting truth ; the bark being more easily detached and more valuable from off a spring-felled than from off a winter-felled tree.

*Laying Off.*

*General observations and definitions.—*Laying off is deli­neating the form of a ship according to its actual dimen­sions, in order to supply the workmen with the exact shape and proper positions of the principal pieces of timber which compose the structure. If the floor be sufficiently spacious, the ship may be laid off in one length ; if otherwise, the operation must be performed in two or more lengths, ac­cording to circumstances.

The principal plans of a ship are the sheer, body, and half-breadth plans.

1*st*, The sheer plan is a projection on a vertical longitu­dinal plane, dividing a ship into two equal parts. Plate CCCCL. fig. 24.

2*d* The body plan is a projection, on an athwartship plane, of transverse vertical sections of the ship, which sec­tions are square to the keel. Fig. 25.

3rf, The half-breadth plan is a projection, on a horizontal plane, of various sections of the ship. Fig. 26.

The principal lines employed, as well in the construc­tion-of a draught, as in laying off a ship, are water-lines, level lines, diagonal lines, and buttock and bow lines.

1*st*, Water-lines, in the sheer plan, are straight lines drawn parallel to the surface of the water. In the half-breadth plan, the water-lines show the boundaries of the sections of the ship, at the corresponding heights in the sheer and body plans. Figs. 24, 25, 26.

*2d,* Level lines are similar to water-lines, except that they are drawn parallel to the keel instead of to the water. To avoid confusion, the level lines are omitted in the sheer draught, but they are drawn in Plates CCCCLI. and CCCCLII.

3*d*, Diagonal lines show the boundaries of various sec­tions formed by planes which are oblique to the vertical longitudinal plane, and which intersect that plane in straight lines parallel to the keel. Plate CCCCL. figs. 25 and 26.

*4th,* Buttock and bow lines are the boundaries of verti­cal sections of the ship, parallel to the vertical longitudinal plane. See B. L., figs. 24, 25, 26.

The main-breadth line is the boundary of the widest part of the ship in each of the three plans. Plate CCCCL.

The top-breadth or top-timber line, in the sheer plan, is a line drawn to the sheer of the ship, fore and aft, at the height of the under side of the gunwale amidships ; and the top-side line is a sheer line drawn above the top-timber line, at the extreme height of the side of the ship. Plate CCCCL.

The cutting-down line is a curve in the sheer plan which corresponds to the upper surface of the throats of the floors amidships, and to the under side of the keelson. Plate CCCCL.

Fore and after bodies. These combined constitute the whole of the ship. They are supposed to be separated by an imaginary athwartship section, at the widest part of the ship, called the midship section, or dead-flat.

Midship body, as sometimes used, applies to an indefi­nite length of the middle part of the length of a ship, in­cluding a portion of the fore and after bodies.

Square and cant bodies may be considered as subdivi­sions of the fore and after bodies. There is a square fore­body, a square after-body, a cant fore-body, and a cant after-body. In the square body the sides of the timbers are athwartship vertical planes, whereas in the cant body the sides of the timbers, although vertical, are not athwart­ship planes.

Moulding and Siding. These terms are nearly synony­mous with thickness and breadth ; observing that the mould­ing of a piece is the dimension of the side on which the mould is applied for determining its shape or curvature. For in­stance, the moulding of a beam is its depth or thickness ; its siding is its fore and aft dimension, or breadth.

Room and space is a certain distance determined by the siding of two adjacent timbers, together with the openings between them ; or it is the distance apart of the joints of the frame, as from A to B in the disposition of the timbers, or one half the distance apart of the stations B, D, F, &c. in the sheer plan. Plate CCCCL. fig. 24.

Shift. This, in its general sense, refers to a certain ar­rangement among the component parts of a ship. Thus we speak of a shift of plank, a shift of dead-wood, meaning thereby the disposition of the buts of the timber or plank, both with respect to strength and economy. In a more li­mited sense, “ shift” means the distance apart of two neigh­bouring huts or scarphs.

The bevelling of a timber\* is the angle contained be­tween two of its adjacent sides. Bevellings are either acute angles, right angles, or obtuse angles. These three separate cases are denominated under bevellings, square, and standing bevellings.

Sirmarks are certain stations marked on the moulds of the timbers at which the bevellings are applied. These sirmarks are denoted in the body plan by the various dia­gonals.

*Description of the draught, consisting of the sheer, body, and half breadth plans.—*The principal dimensions of a ship are length, breadth, and depth. Connected with and dependent on these three dimensions, are three plans, named the sheer, half-breadth, and body plans. These combined constitute what is termed the draught of a ship. We purpose to describe them separately. Plate CCCCL.

1st, The sheer plan or elevation (fig. 24) is the represen­tation of an imaginary longitudinal section, dividing the ship into two equal parts, by a vertical plane passing through the middle of the keel, stem, and stern-post. This section is bounded by the fore part of the knee of the head, under side of the keel or false keel, aft side of the rudder, rake of the stern, and the sheer of the upper part of the top-side.

Besides this plan being a section of the ship amidships, showing the sheer of the decks, cutting-down line, stations of the masts, &c., on it are also projected, in lines perpen­dicular to the aforesaid longitudinal section, the ports, cat­head, head-rails, side counter-timber, quarter-gallery, main- breadth line, channels, dead-eyes, &c. From all this we see that the chief use of the sheer plan is to obtain heights and lengths ; heights measured from the upper edge of the rabbet of the keel, and lengths measured from the after or the fore perpendicular. These perpendiculars, which define the length of the ship, are drawn in most ships of war at the ends of the lower or gun deck ; the foremost perpen­dicular at the aft side of the rabbet of the stem, the after­most at the foreside of the rabbet of the stern-post.

Occasionally the interior fittings and accommodations are shown on the sheer plan, as the beams, magazines, store-rooms, well, pumps, capstans, cabins, and other mi- nutiæ ; but as these produce confusion by multiplying lines, it is usual to represent the interior economy of the ship on a separate plan, called the “ profile,” or plan of the inboard works.

*2d,* The half-breadth plan (fig. 26) principally shows the form of the ship, 1*st*, when cut by water-lines ; *2d,* by level lines ; and, 3*d*, by diagonal lines. As before observed, the planes of these diagonal sections intersect the longitu­dinal plane of the ship, in straight lines parallel to the keel. Besides the above, the form of the decks, main-breadth and top-breadth lines, may be also delineated on the half-breadth plan ; together with the projection of the planes of