sheer plan, the intersection of the joint of the cant-timber with the bearding line. From this point in the sheer plan erect a perpendicular to the keel. Place the stock of the bevel to this perpendicular, and the tongue to the direction of the stepping line, and the required bevelling is obtained.

To lay off the cant-timbers by level lines. The reader will observe that two processes were necessary in laying off cant-timbers by the horizontal ribbands ; for, first, we had to take the square distances of the intersection of the timber with each horizontal ribband from the middle line in the half-breadth plan, and transfer these distances to the cor­responding diagonals in the body plan ; and, secondly, we had to take the oblique or cant distances of the timber with the same horizontal ribbands in the half-breadth plan, and transfer them to the body plan. But the method of laying off these timbers by level lines is far more simple, only one process being required. Thus, to lay off the joint of W, take the cant distances from the middle line in the half-breadth plan to the intersection of the joint with each level line, and transfer these distances from the middle line of the body plan, along each of the corresponding level lines. A curve through the spots thus obtained gives the true form of the timber.

In considering these two methods of laying off cant-tim­bers, the reader will remark, that the difference between them consists in this particular, viz. in the first method, or by horizontal ribbands, the heights in the body plan along which the cant distances are set off, are procured from the half-breadth plan ; whereas in the second method, or by level lines, these heights are already given in the body plan.

But it may be naturally asked, which is the preferable method ? To this we reply, if the student can rely on the fidelity of his labours, let him by all means lay oft’ the cant­bodies by level lines : if, however, he mistrusts the accuracy of his work, let him adopt the plan by horizontal ribbands. The reason of this opinion is, that as the level lines cut the body obliquely, any inaccuracy is more magnified by them than by the diagonals, which cut the body nearly at right angles. With this explanation, we leave the choice of these plans to the discretion of the student.

The bevelling edges are laid off by level lines in the same manner as the joint, except, as in the former method, the cant distances are taken from the points *a* and *b,* instead of from the point W. The bevellings of the timber are taken as explained in the former method.

To obtain the projection of the cant-timbers in the sheer plan. Square up the intersections of the timber with any of the lines except diagonals, in the half-breadth plan. Diagonals are excepted, because in the half-breadth plan they are not in their natural position, but are supposed to revolve into a horizontal position before they are projected into this plan. Through the spots thus obtained pass a curve, and we obtain the projection required.

This operation is necessary for a variety of purposes. Thus the projection of the fashion-pieces into the sheer plan, shows the boundary of the ends of the transoms. (Plates CCCCLII. and CCCCLIII.) A like projection of the other cant-timbers in the fore and after cant-bodies, shows the arrangement of the heads and heels of the cant-timbers, and their disposition with respect to the bow and after ports.

To lay off the transoms. As the ends of the transoms are bounded by the fashion-pieces, it becomes necessary to ob­tain the projection of the fashion-pieces in the sheer and body plans. This is done as previously described with re­spect to any other cant-timbers. In Plate CCCCLII. the transoms are projected into the half-breadth plan ; but as this creates confusion from the multiplicity of lines, it is customary to lay off the transoms by themselves, and to show both sides of the ship. With this view Plate CCCCLIII. is drawn, where fig. 32 represents the plan of the transoms in which the square timbers 29, 31, the buttock-lines 1, 2, 3, 4, 5 the middle line, the bearding of the post, the fashion-pieces, and the wing-transom, are transferred from the half-breadth plan.

In the sheer plan, where the wing-transom intersects the fore part of the rabbet, a line is drawn at right angles to the keel. This line is called the perpendicular to the transoms. A corresponding line is drawn in the plan of the transoms.

Transoms may generally be divided into four kinds. 1*st*, Those which have a round-up and a sheer : 2*d*, those which have a round-up and no sheer: *3d,* those which have neither a round-up nor a sheer, their upper and lower sides being level both athwartships and tore and aft ; they are called horizontal transoms : and, 4*th*, those which are square to the stern-post, or rather as square to the body as they can be drawn. These are called cant-transoms ; their upper and lower sides are planes.

The deck-transom must necessarily have the round-up and sheer of the deck. We have supposed the wing and filling transoms also to have a round-up and sheer to them, although they are sometimes designed, particularly in small ships, without any sheer. It is customary to distinguish the transoms under the deck-transom as No. 1, 2, 3, &c. They are delineated in fig. 31 as horizontal transoms ; occa­sionally, however, they are canted, as AB, Plate CCCCLII. fig. 29.

From the nature of horizontal transoms, as previously ex­plained, they will be represented in the sheer and body plans by level lines. (Figs. 31 and 33.) This being done, we have next to make a horizontal section of the ship, at the upper side of each of these transoms, which will of course give the curves to which the moulds are to be made. As the after part of the transoms is terminated either by the fore side of the rabbet, or by the bearding line of the stern-post, in the sheer plan take the distance from the intersection of the upper side of the transom with the fore part of the rabbet, or with the bearding line, to the perpendicular of the transoms. Set this distance oft’ in the plan of the transoms, on each bearding line square from the perpendicular to the transoms, then by joining these two points we obtain the after part of the transom amidships. Again, in the sheer plan, observe the inter­section of the upper edge of the transom with each but­tock-line. Take the distances of these intersections from the perpendicular to the transoms ; transfer the said dis­tances to the plan of the transoms, by setting them off from the perpendicular to the transoms on the correspond­ing buttock-lines. A curve line passing through these spots will give the form of the upper after-edge of the transom. The accuracy of this curve may be tested thus. In the body plan, take the distances from the middle line of the intersection of the upper side of the horizontal tran­som with each square timber, transfer these distances from the middle line on each square timber in the plan of the transoms ; the spots so obtained ought to correspond with the curve drawn by means of the buttock-lines.

To lay off a transom which has a round-up and a sheer, it should be understood that the mould given to the workmen for trimming the transom to its round-up is generally a circular arc, applied square to the sheer ; and that the mould for trimming it to its round-aft is applied flat upon and bent round its upper surface.

In the sheer plan, at the height of the intersection of the middle of the transom with the fore part of the rabbet of the post, draw a line to the sheer of the transom. Con­tinue this sheer line until it meets the perpendicular to the transoms, at which point draw a line downwards at right angles to the sheer line. Fig. 31.

In the body plan, at the height of the upper side of the transom amidships, draw a level line ; draw also a circular arc to the round-down of the transom, square to the sheer, the before-named level line being a tangent to this arc ;