words, their “ room and space,” should assimilate as near as may be to the square body. The hawse-pieces should be so situated that they may not be too much wounded by the hawse-holes ; and in order that the knight-heads may not be injudiciously weakened by the bowsprit, their heads should be separated from the stem, at least in large ships, by a timber of from six to eight inches siding.

It should be remarked, that in the square body every other joint only is laid off, the intermediate joints being drawn in after the laying off may be said to be complete. But in the cant-bodies every joint is laid off, each joint, as in the square body, serving to mould the adjacent timbers on its fore and after sides. Still, if the opening between the timbers of a cant-frame should be very great, it would be more accurate to strike in the openings on the half­breadth plan, and to lay off each timber independent of the other, that is to say, the after edge of the foremost, and the fore edge of the aftermost timber.

Supposing the disposition of the fore and after cant-bo­dies completed as in the half-breadth plans (Plates CCCCLI. and CCCCLII.), in which the joints of the cant-frames are marked c, we proceed to lay them off in the body plan. This is generally done by one of two methods ; either by horizontal ribbands, or by level lines. We must here re­mind the reader, that the square timbers in the body plan, as A, B, C, &c., 1, 2, 3, &c., are not only projections of the same timbers in the sheer plan, but they are absolutely the real shape of the said timbers, on the supposition that the ship was cut asunder athwartships at those stations. Now, if we conceive a vertical section of the bow to be made, not athwartships, but in the direction of the plane of a cant­timber, as W, Plate CCCCLI. fig. 27, and if we project this section to the body plan, this projection will not be the shape of the cant-timber. But if keeping the plane of the cant-timber W fixed at its vertical intersection with the longitudinal plane, we make it revolve round the said in­tersection as an axis until it comes athwartships, and if in its new position we project it from the sheer plan into the body plan, then, as in the square body, we not only obtain a projection, but also the true form of the timber, to which a mould may be made for trimming it. We shall now ex­plain the manner of performing this ingenious process, se­lecting as an example the cant-timber W in the fore body.

To lay off cant-timbers by horizontal ribbands. Observe the intersection of the cant-timber, marked W, with the upper horizontal ribband in the half-breadth plan, Plate CCCCLI. ; take the nearest or perpendicular distance of this point from the middle line ; set this distance off hori­zontally from the middle line of the body plan, so as just to intersect the corresponding diagonal. In like manner, ob­tain similar spots from the remaining horizontal ribbands in the half-breadth plan on all the other diagonals in the body plan, and if through the spots so obtained a curve were drawn, this curve would be the projection, not the true shape, of the cant-timber. Next through all the above- named spots on the diagonals in the body plan, draw ho­rizontal lines. In the half-breadth plan, take the distances along the cant-timber from where it intersects the middle line to its intersection with each of the horizontal ribbands. Transfer these distances to the body plan, by setting them off from the middle line, on each of the corresponding ho­rizontal lines before named. Lastly, through the spots so obtained pass a curve, which curve will be the absolute shape of the cant-timber, which has thus been made to re­volve round the point W in the half-breadth plan, from its original position, which was oblique to the middle line, until it came into an athwartship position, or square to the mid­dle line.

We have thus delineated the form of the cant-timber at and below the upper diagonal. To obtain its form at the top-side, proceed thus. In the half-breadth plan, square up

the intersection of the cant-timber with the main-breadth line, to the corresponding main-breadth line in the sheer plan. Transfer the height so obtained to the middle line of the body plan, through which point draw a level line. In the half-breadth plan, take the distance in the direction of the cant-timber, from its intersection with the middle line to its intersection with the main-breadth line, and set off the same distance from the middle line of the body plan, along the level line just drawn. Proceed in like manner with respect to the top-breadth, top-side, port-sill, or any other similar lines, and we thus procure a series of spots through which the cant-timber may be continued from be­low.

To obtain the ending of the timber. Draw in the beard­ing line or the half thickness of the dead-wood in the half­breadth plan, parallel to the middle line. Square up the intersection of the cant-timber with this bearding line, to the bearding line in the sheer plan. Level in this height to the middle line of the body plan, where a horizontal line must be drawn, on which line set off from the half-breadth plan the distance between the intersection of the cant­timber with the middle line, and its intersection with the bearding line. The spot thus obtained determines the end­ing of the timber.

Having laid off the moulding edge of W, we proceed to lay off its bevelling edges. Parallel to and on either side of the joint W, draw two lines *ae, bd,* to represent the sidings of the adjacent timbers. The side extremities of these lines terminate like the joint at the top-breadth line ; their mid­ship extremities are bounded by a small line *ab* drawn at right angles to the joint W at its intersection with the middle line.

In our former description we supposed the joint of the timber to revolve round the point W, until it, the joint, came into an athwartship position. Now, instead of ima­gining the joint only to be thus circumstanced, let us sup­pose the whole cant-frame to revolve round the point W ; in which case the bevelling edges *ac,* *bd* will become athwart­ship lines, and *ab* will become a fore and aft line, and may be regarded as the middle line, or rather a small part of the middle line, of the ship. Hence, in laying off the two bevel­ling edges *ac, bd,* we proceed as was before described for the joint, with this exception, that we take the cant dis­tances along *ac, bd,* from the points *a* and *b,* instead of, as before, from the point W, at the middle line.

The bevelling edges are delineated, as just explained, in the body plan, in which plan they fall without, coincide with; or fall within, the joint ; and these three conditions deter­mine whether the timber has a standing, square, or under bevelling. Therefore, across a board the breadth of which is equal to the siding of the timber, draw a line square to its edges. In the body plan, at the various bevelling spots, as sirmarks, port-sills, heads, &c. take the nearest distances of the joint from the bevelling edges, and set these distances on the right-hand side of the board, either above or below the square line, according as the bevellings arc standing or under. Then join the points so obtained, and the intersec­tion of the square line, with the left-hand side of the board. The angles formed by the left-hand side of the board, and the various lines across the board, denote the respective bevellings at the corresponding stations in the body plan, which bevellings will be applied square to the curve of the timber.

For trimming and cutting off the heel two bevellings are necessary. The bevelling against the dead-wood is simply the angle formed in the half-breadth plan by the direction of the timber and a fore and aft line, and is therefore taken by placing the stock of a bevel to the cant of the timber, and the tongue to the bearding line.

To obtain the bevelling for cutting off the heel against the stepping. Square up from the half-breadth plan to the