A change in of timber joints

A look at the difference between Anglo-Saxon tree wrights joints used in the 10th and 11th century's and those joints used by Medieval Carpenters building houses and the wood working methods these imply.

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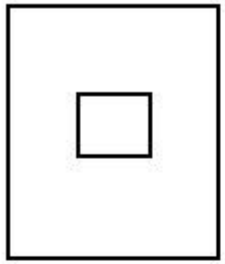
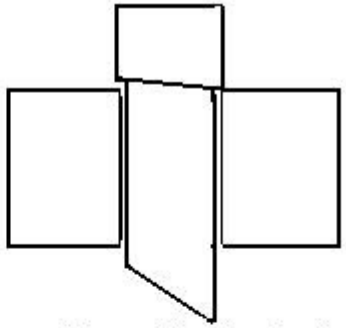
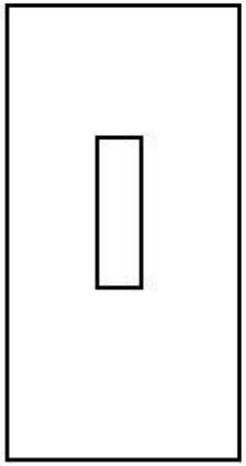
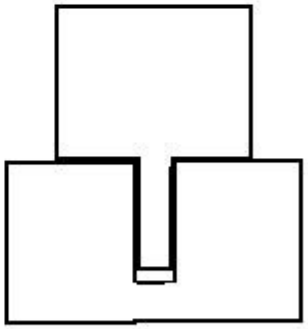
Hemington Bridge Caissons as found 1100 AD picture ULAS





Anglo Saxon locating joint, loose fit in square hole, small shoulders do not bear evenly on the timber face. Small area of the shoulder bears so not good load joint as the wood will compress.

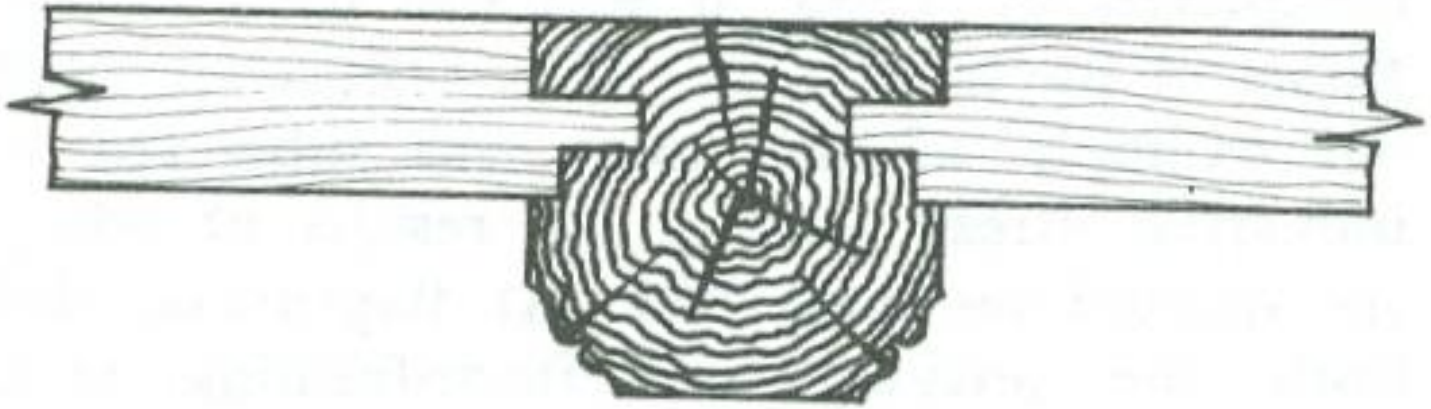




Medieval mortise and tenon after 1150 large area of shoulders bear on the timber face making this a good load bearing joint.

The standard joint of English Medieval Carpentry after 1200 AD

- Mortise and tenon with shoulders and pegs.
- Pegs normally draw pegs.
- Shoulders of the tenons flat
- Bearing surface round the mortise flat.
- Tenon itself, though strong, often serves a locating function while the main part of the weigh is supported by the shoulders of the tenon.
- There is often clear evidence that the hole drilled in the tenon and the holes drilled through the mortise were offset so that the tapered peg tightened the joint.



Joists

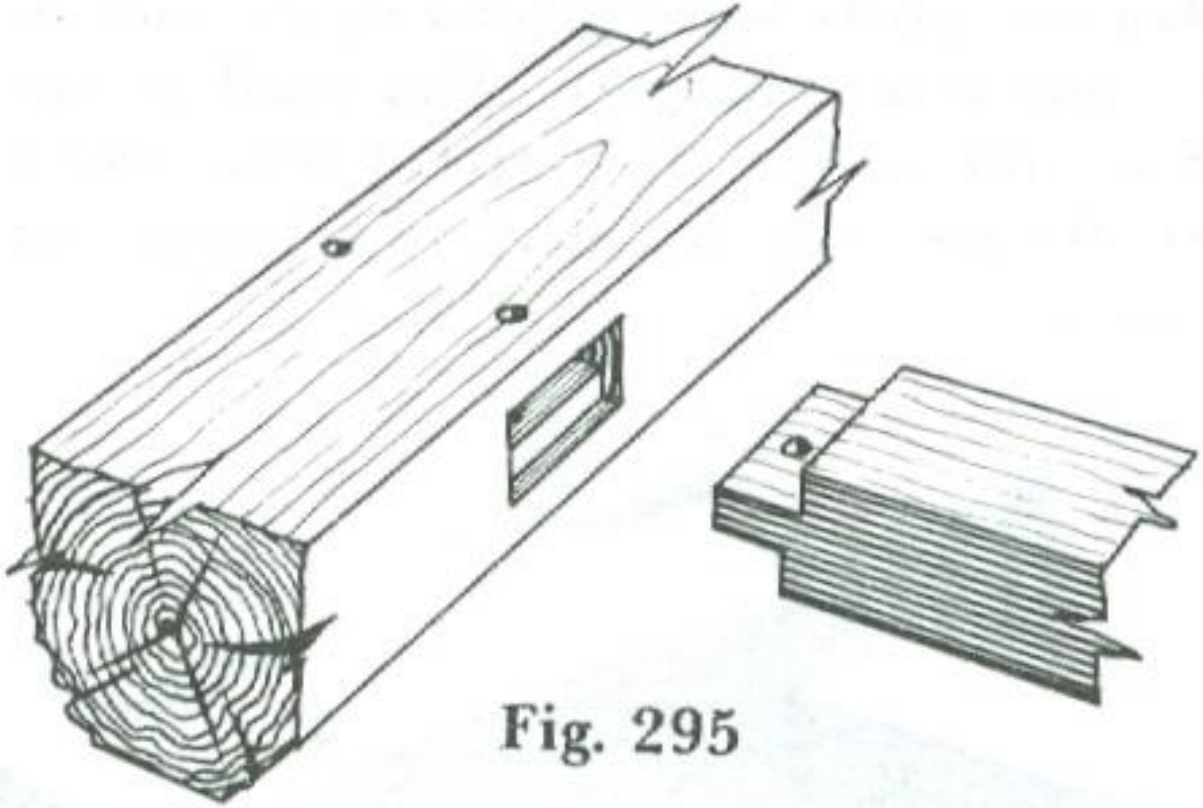
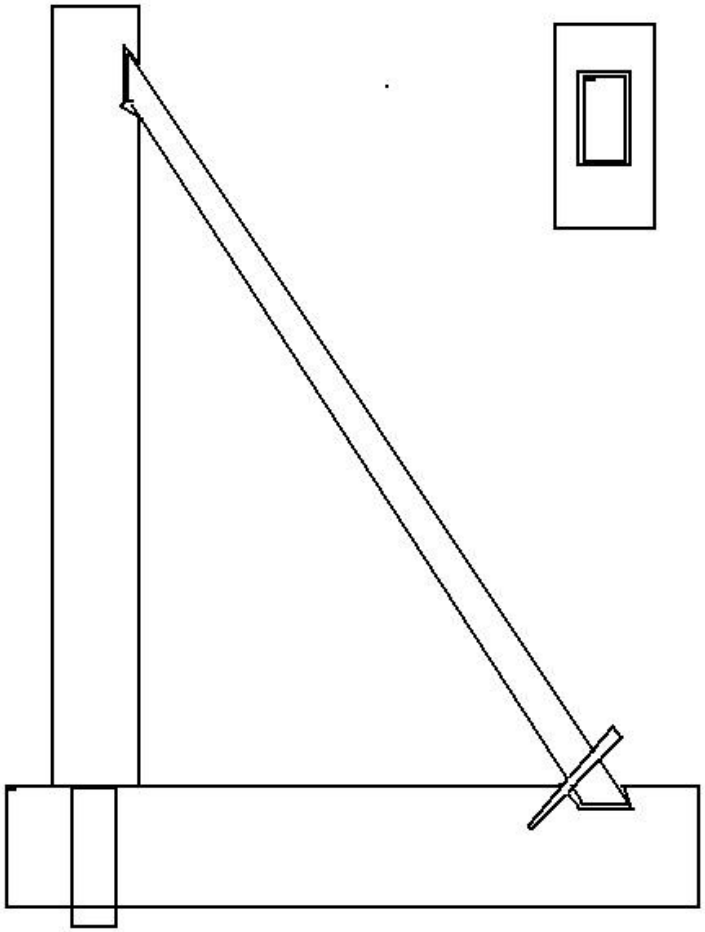
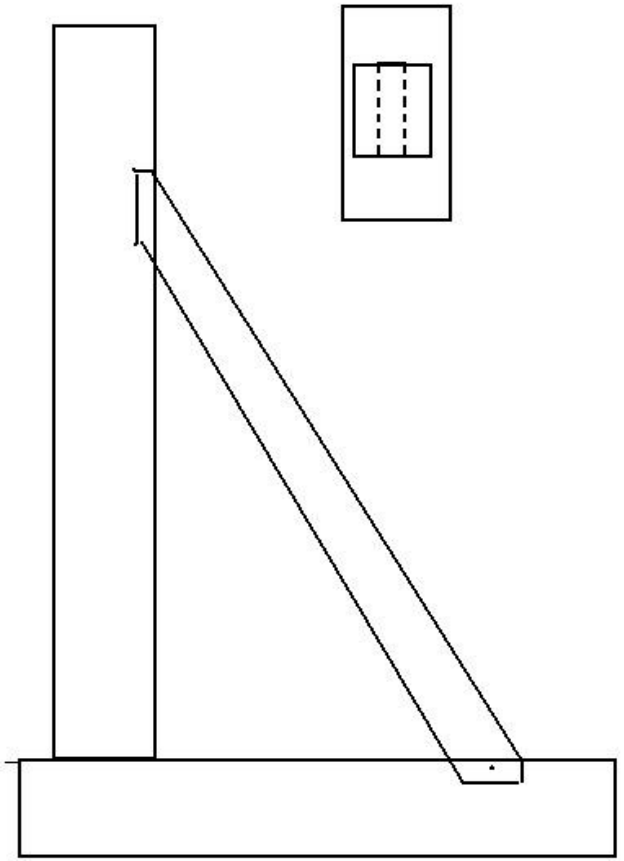


Fig. 295



Anglo-Saxon the whole cross section of the brace is housed in an axe cut notch, sometimes pegged. The load bears either on the peg or the pointed end of the brace in either case the wood is likely to compress.



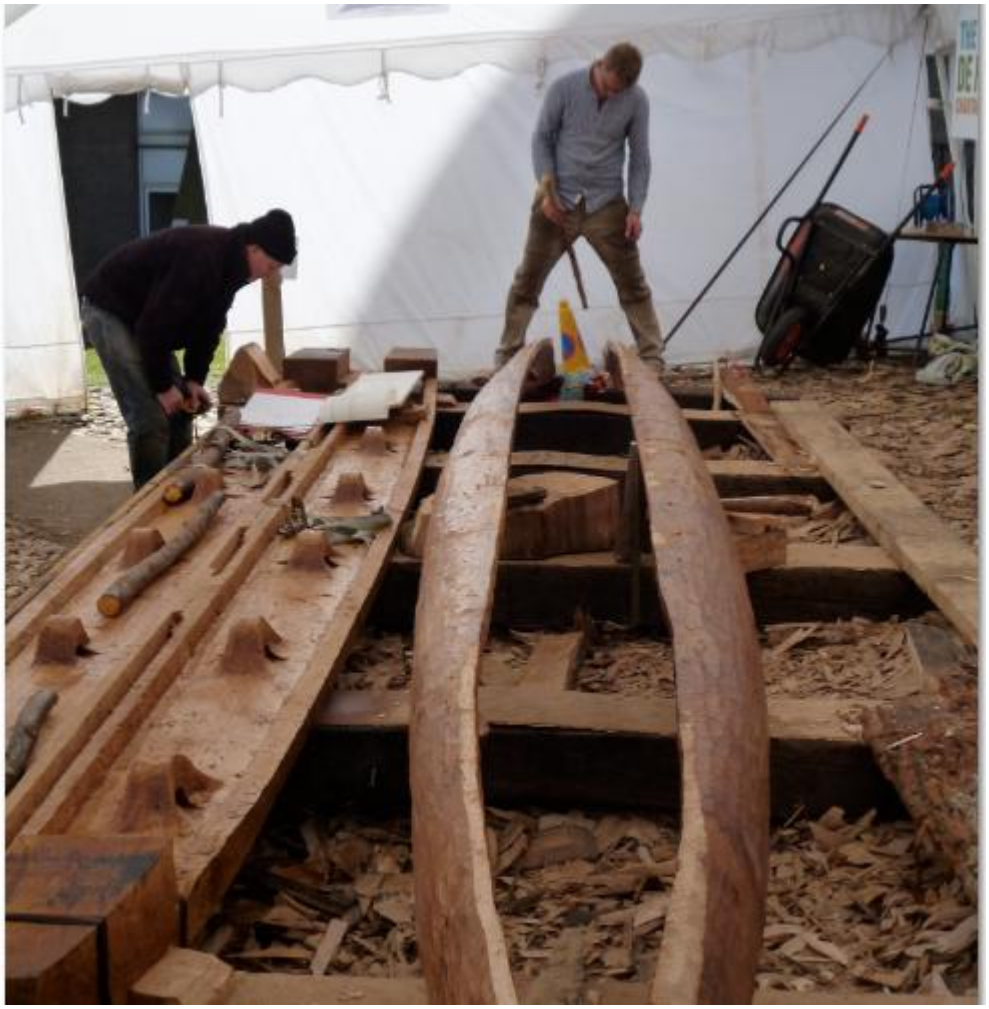
The Medieval brace after 1150 the tenons alone are housed and the load bears on the flat shoulder of the brace resting against the face of the beam. In tension the draw pegged joint is much stronger than the pegged Anglo-Saxon joint.

Background

- By 1550 BC Bronze age wood workers had master carving timber into complex shapes. Some of this carving involved regular curves and straight lines over 10m long.
- This means that there are other reasons for specific joints being used.
- The Dover Boat has a specific unique joining system that was unknown until its discovery 20 years ago.
- The large cleats seen on the boat timbers were used only on boat construction. A point I will come back to as many types of woodworking seem to be specific.

Complete mastery of carving oak shown in the Bronze age Dover Boat

Half Scale bronze age reconstruction carved with Bronze Tools



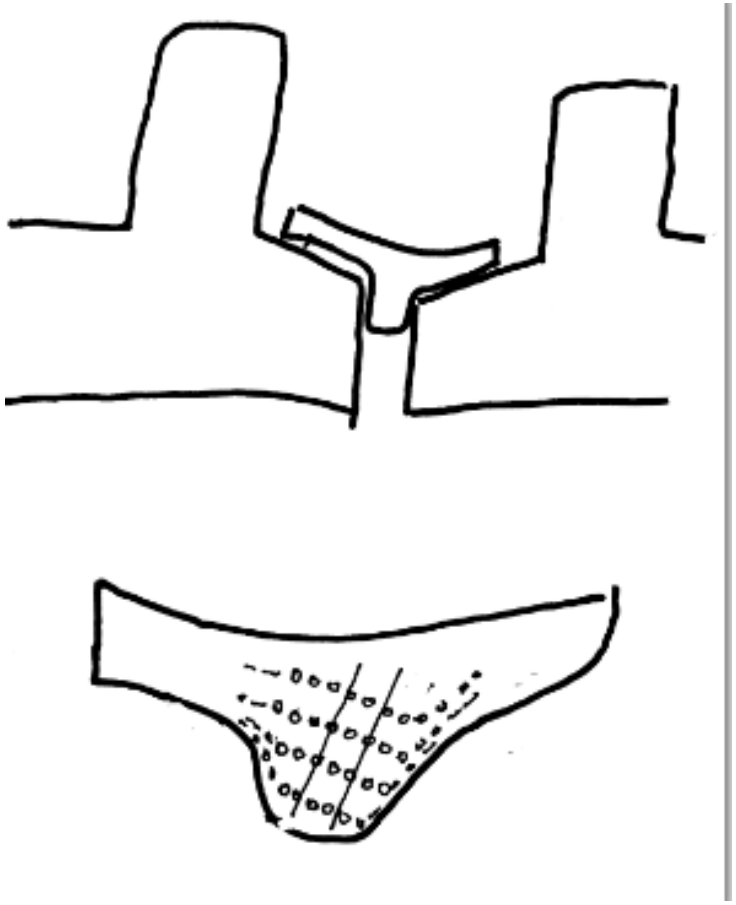
Wood working technologies used in one craft do not transfer to others

Identifying the original shape of a timber

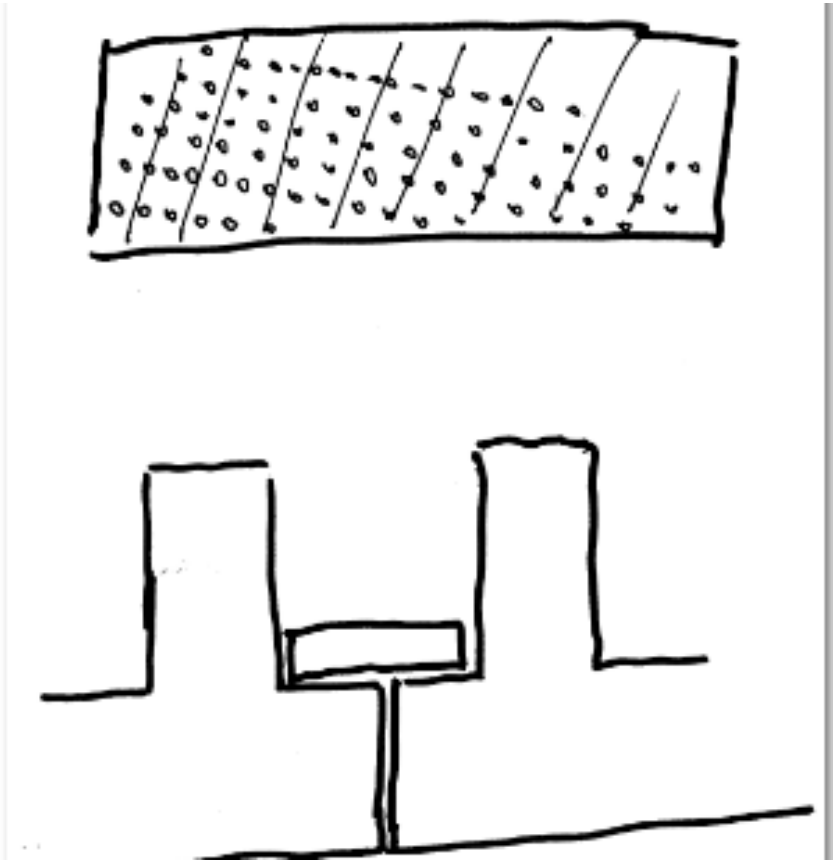
- Before looking at details of wooden structures it is important that we understand what has happen to the wood since it was originally shaped, How it has been distorted by wear, and by the weight of the soil once it has been buried in the ground.
- You only acquire the skill of identifying this distortion, by working with wood noting the grain and how it changes when it is cut to shape. As well as seasoning where a piece of timber looses its shape

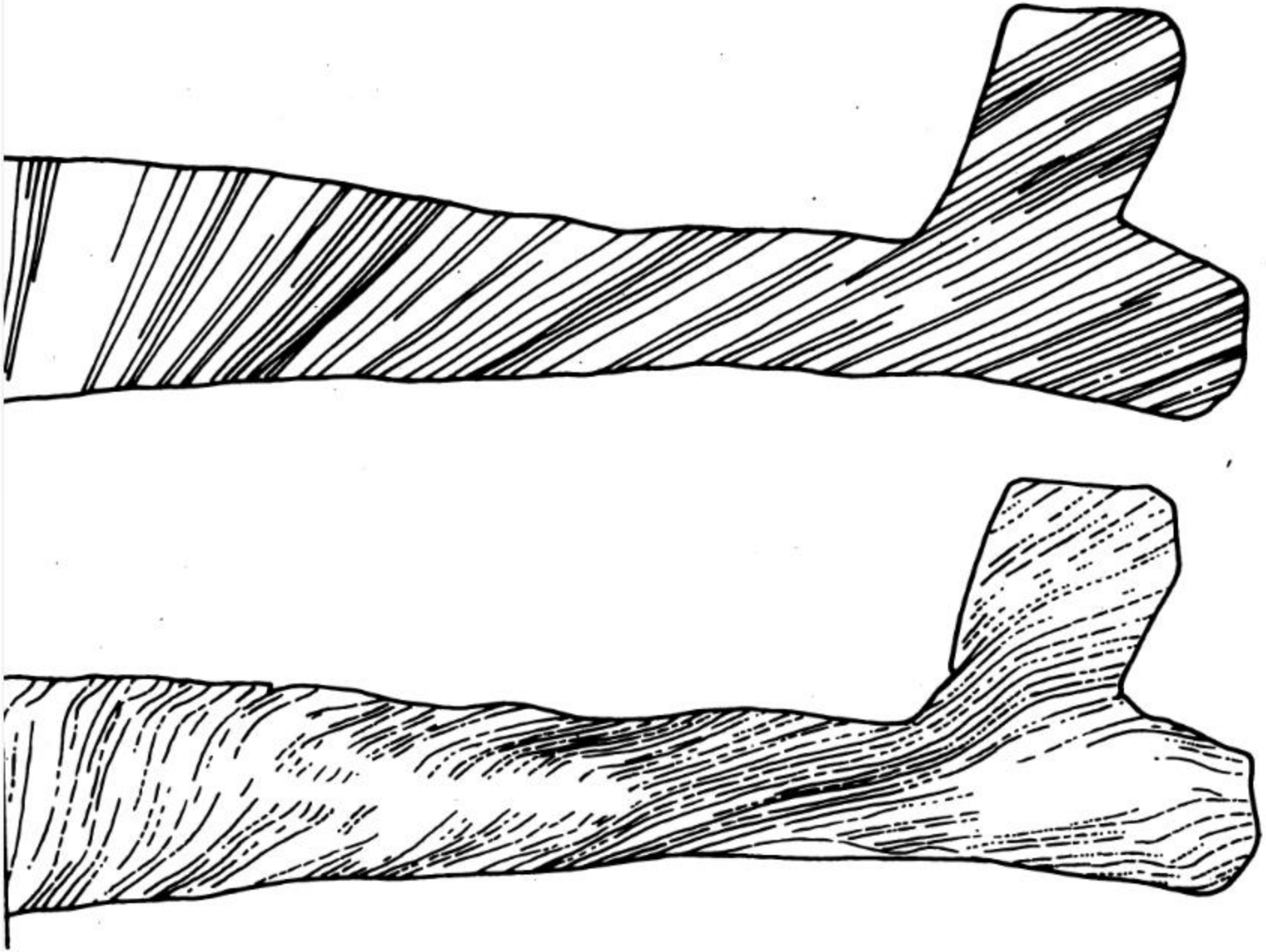
Correcting for compression

Central lath bent and distorted spring vessels of annual rings squashed together



Correcting for distortion spring vessels remain even.





Oak = eg Chene
Medullary rays = /marvstraaler, 'spejlet‘,rayon medullaire
Annual rings = årringe/aarringe
Compression = sammentrykning
Concertina. = concertina (lille sekskantet harmonika)
Fluted as in column or trunk = riflet
Hydraulic pressure = hydraulisk tryk
Radial = radial
Radius = radius
Vertical = vertikal, lodret
Horizontal = horizontal, vandret
Circumference = omkreds

Making the tools do the job we expect them to do.

Robin Wood hewing with bronze adze, with light weight handle.

Hemington bridge Caissons with reconstruction models superimposed.

Caissons Picture ULAS models Roy McDonnell

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Bay of Medieval Building one sixth scale

All timbers in the original building prefitted on the ground, peg holes drilled numbered and taken to pieces reassembled.

Even rafter pairs have peg holes so that they can be fitted into a template and all match.

Narrow bladed axe used both for felling, cross cutting, cutting joints and rough hewing.

Broad axes used for finishing wooden surfaces.

Spoon augers used to drill holes

Using the correct tool leaves the same tool marks and tool signature on the timber as on original timbers

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Broad axe man hewing with one eye closed.

Medieval carpentry, axeman rough hewing with narrow bladed axe.

Note chalk line directly beneath his feet.

Broad axe resting against the trestle.

The tree being squared up has been notched along its side to ease wood removal. From the shadow on the face of the hewn timber the axeman is hewing away from himself probably to a snapped chalk line on the top face.

The men in the middle are working on a preassembled frame cutting mortises and drilling peg holes.

Other tools from front to back twybil chalk line , chalk box, spoon auger, broad axe, sharpening stone on belt, trestle and dog in timber.

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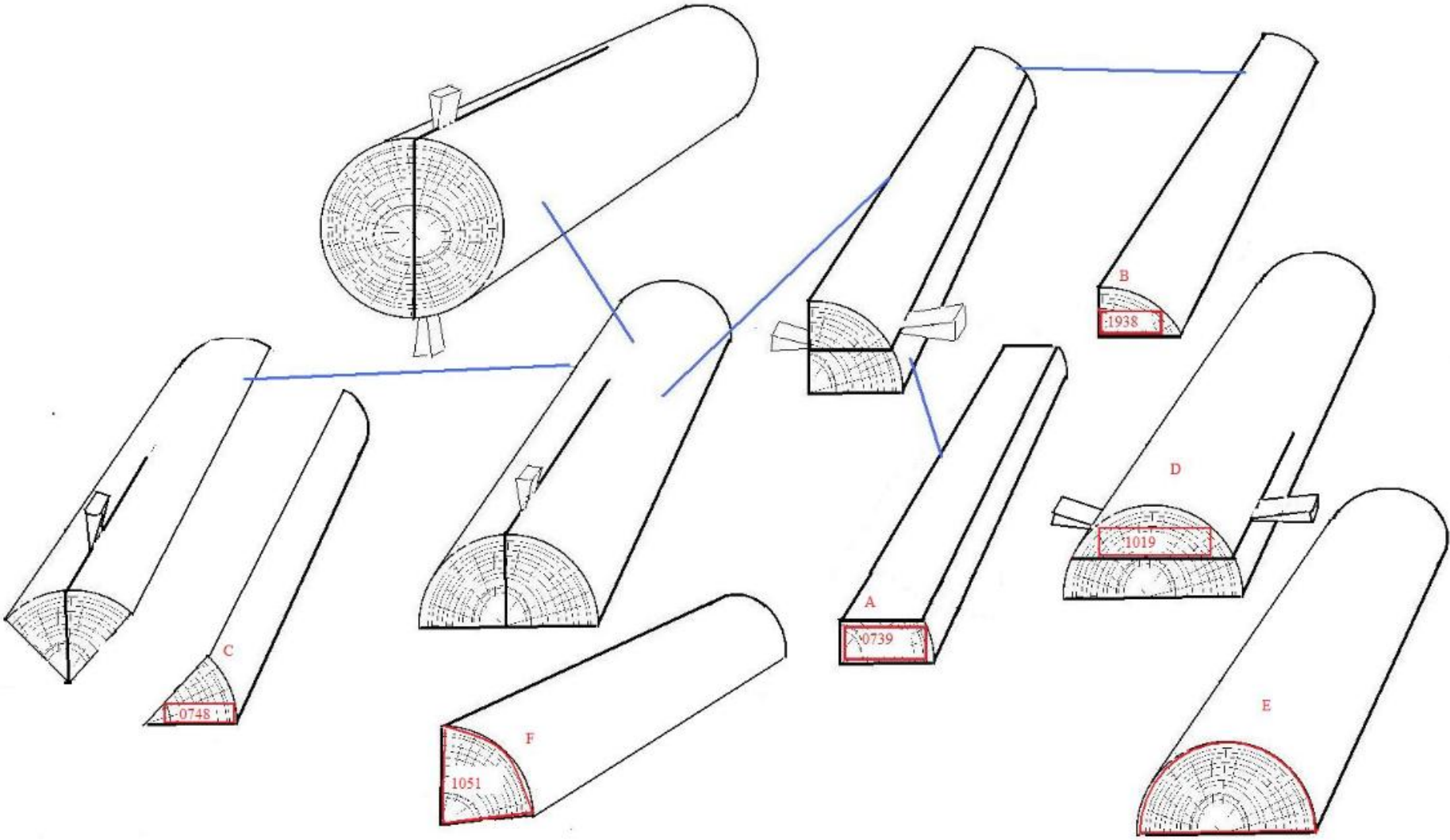
Split sections made by radial and tangential splitting.



Splitting ash butt without metal tools

Cleft oak timbers

With straight grained timber note how straight and even the splits are over this 6metre length.

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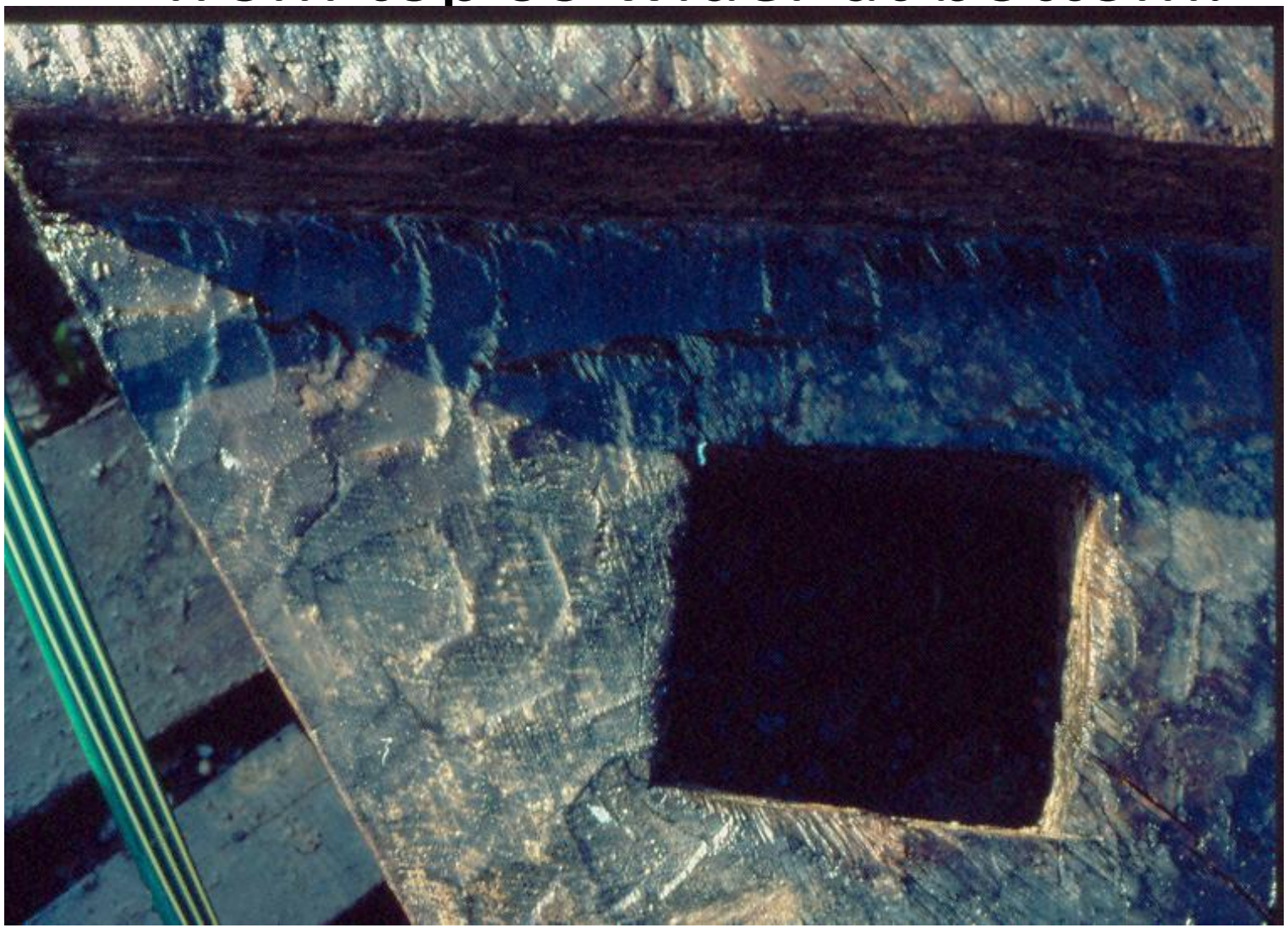
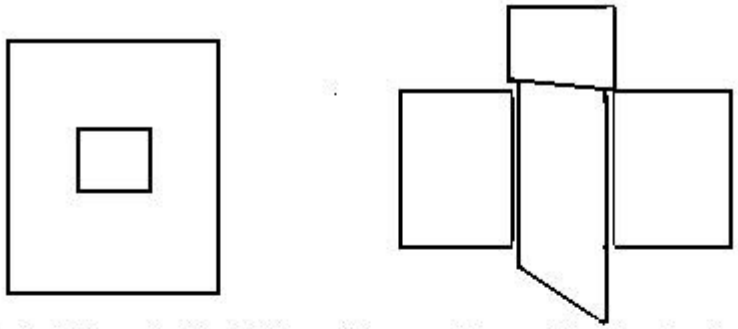
Through Saxon Mortise hole all cut from top so wider at bottom.



Top Anglo-Saxon joint
Lower Medieval joint



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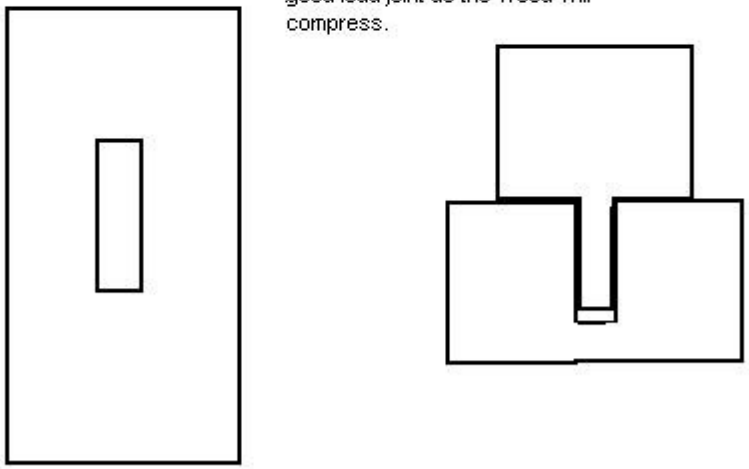

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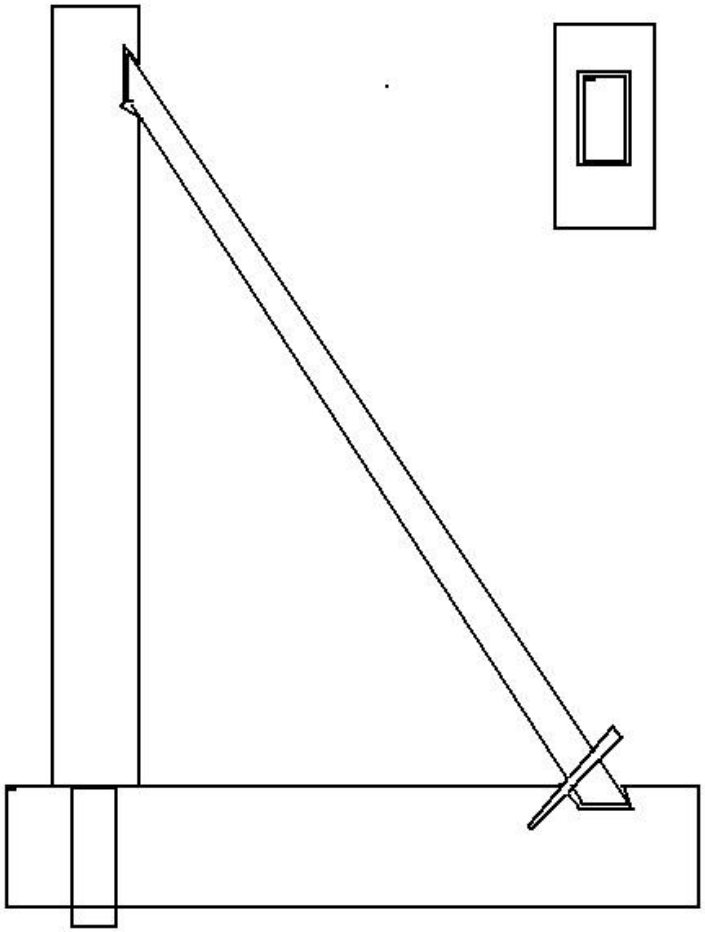

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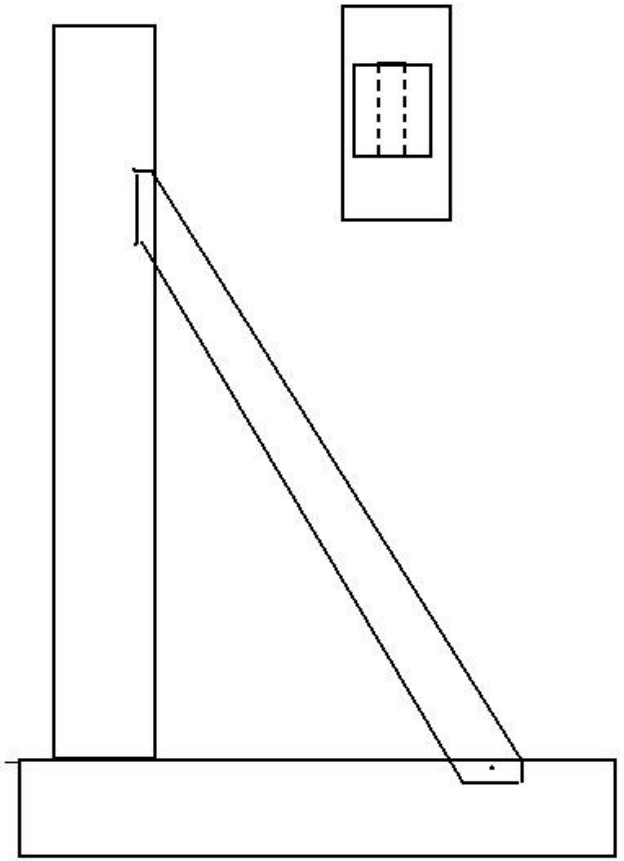

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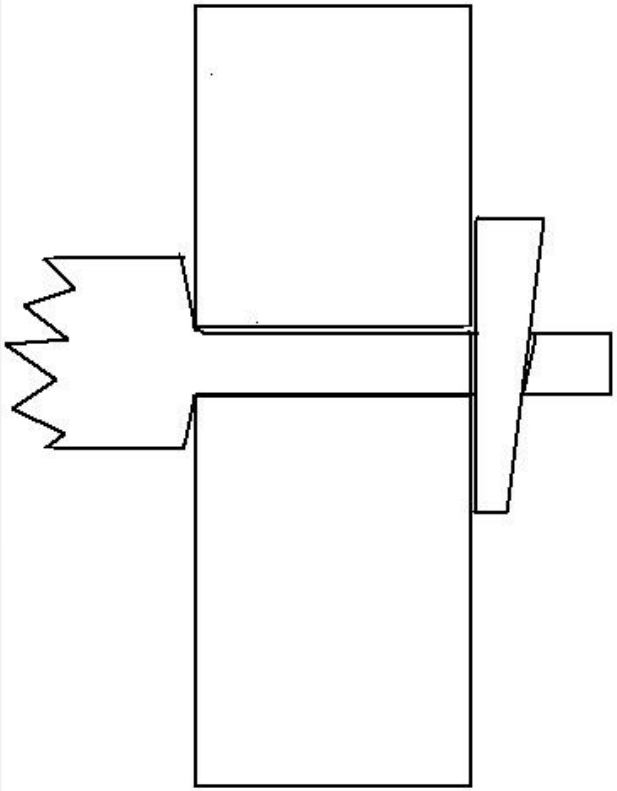
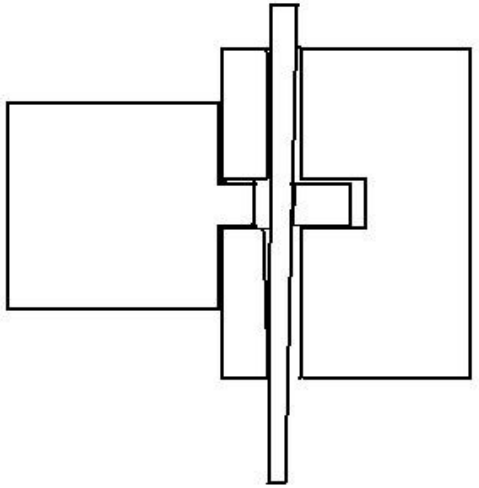
Left Anglo-Saxon tusk tenon
Right Medieval draw peg joint

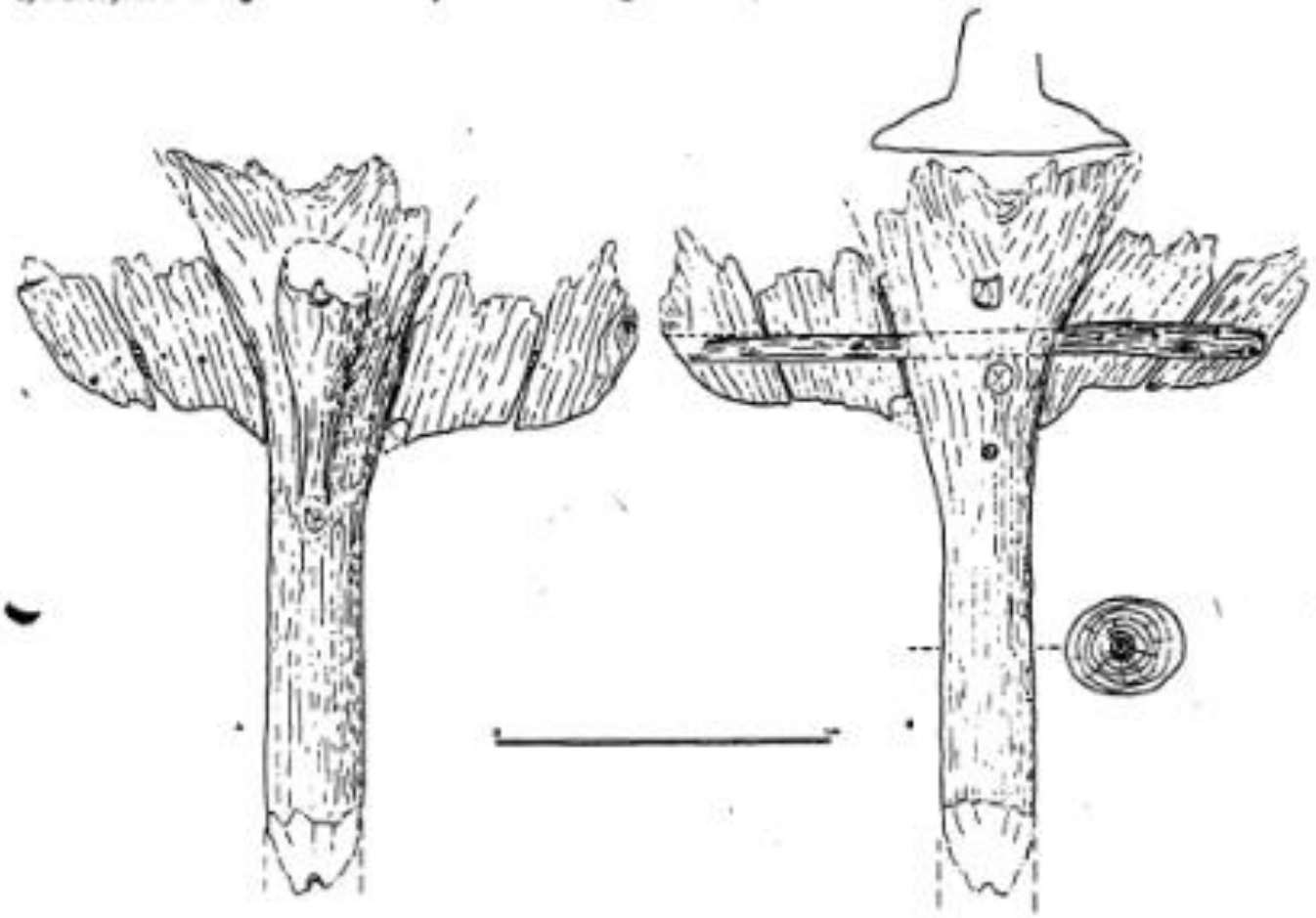


Anglo-Saxon Tusked tenon joint tightens or tensions a joint with a wedge through the end of the tenon that protrudes from the post.



Medeival pegged joints after 1150 to 1200 were tightened or tensioned by off setting the hole in the tenon so that it was pulled tighter as the tapered peg was hammered in.

Fig. 4. - *a) Detail of the 10th century arcade post assembly from site VRY89. S. face as found reused. b) North face showing the cross batten fastened with Anglo-Saxon style boat nails.*



Tusk tenon joint from Barking Abbey

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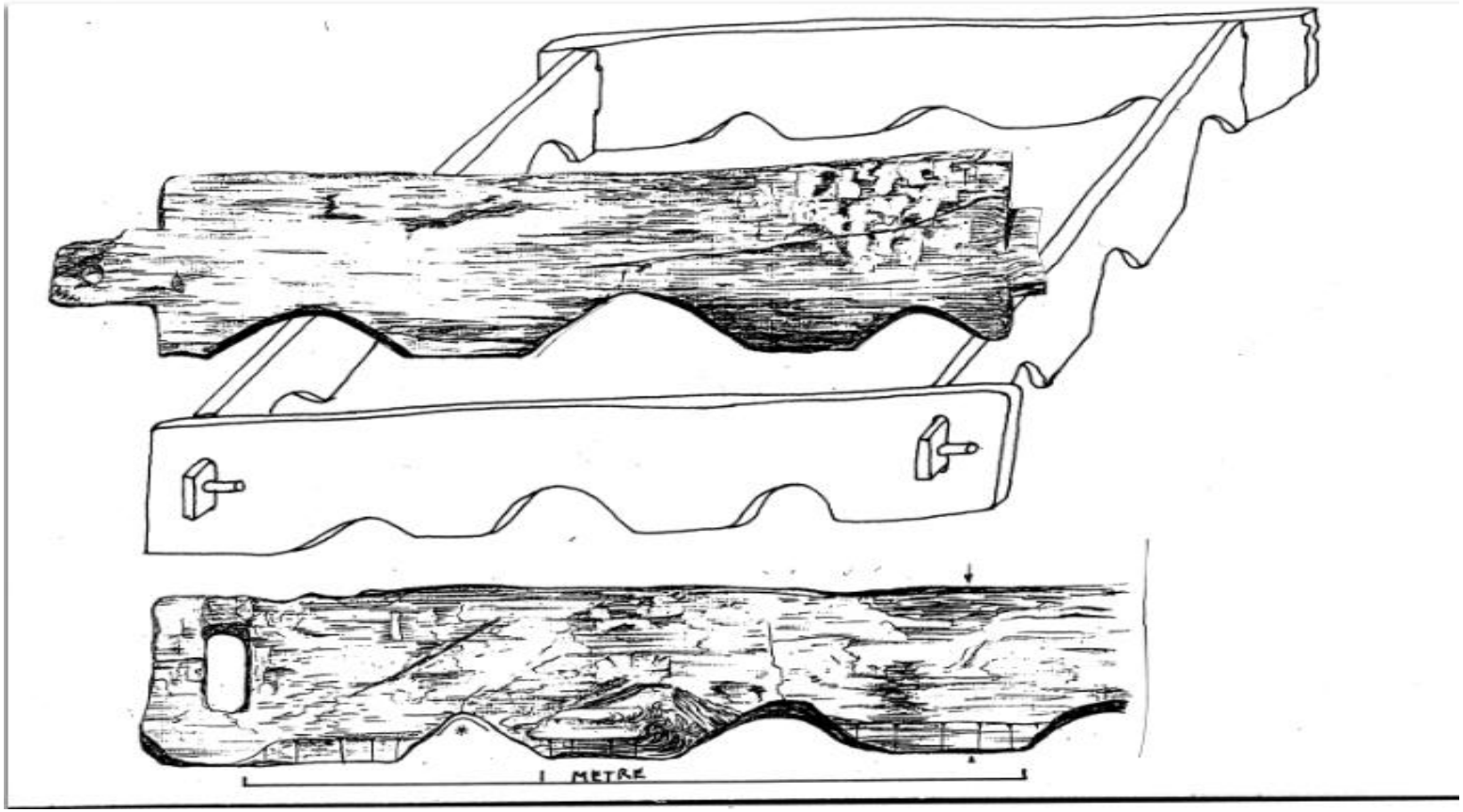
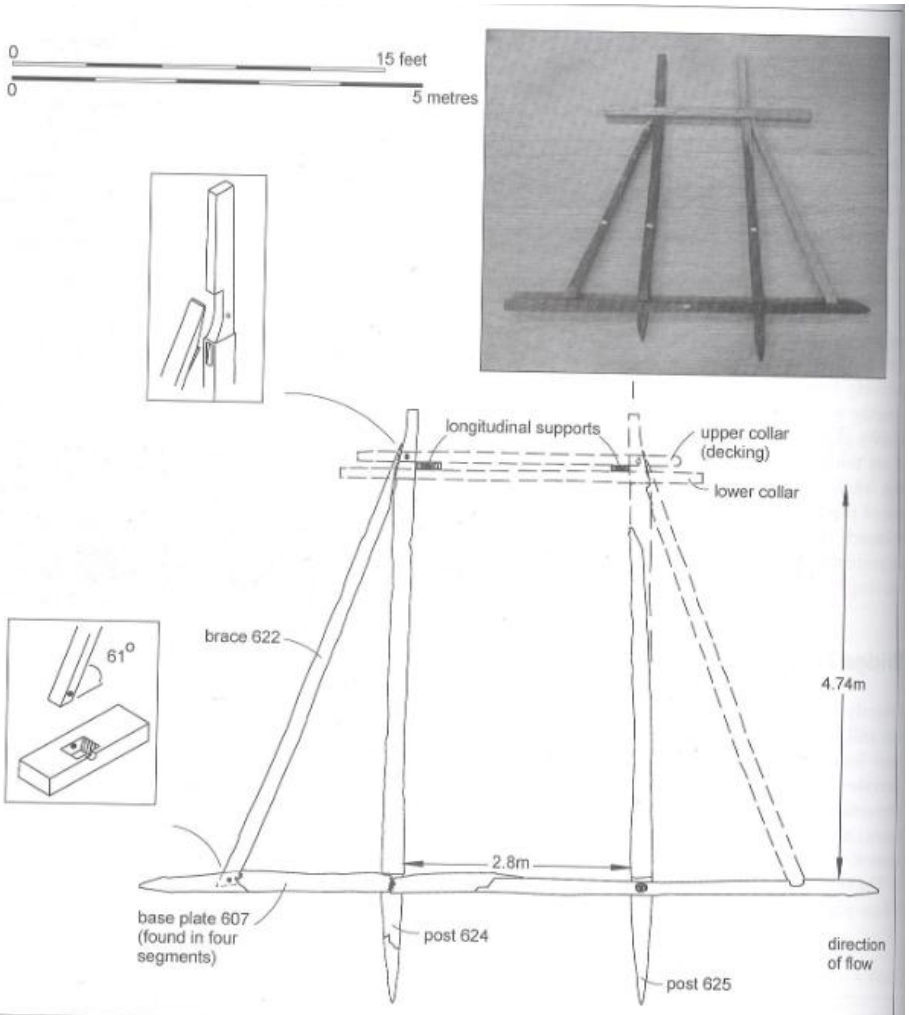


Contemporary structure to caissons top horisiontal clasps timber



re 25 Reconstruction of Bridge I trestle. The dashed lines represent missing timbers, reconstructed from jointing information. The
show details of the jointing mechanisms.

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Measuring blade width and profile by breaking away wood to revel jam curve.