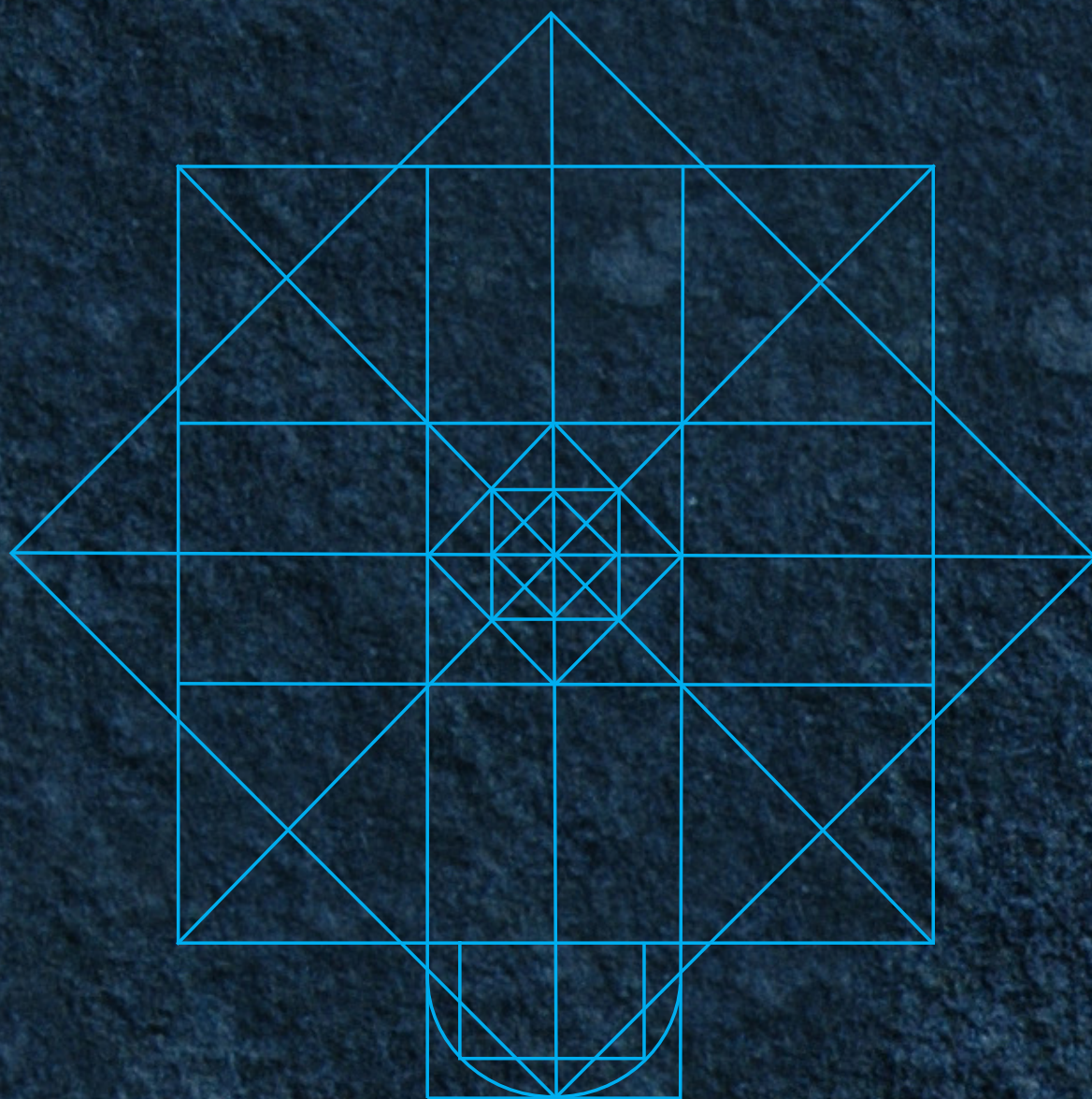
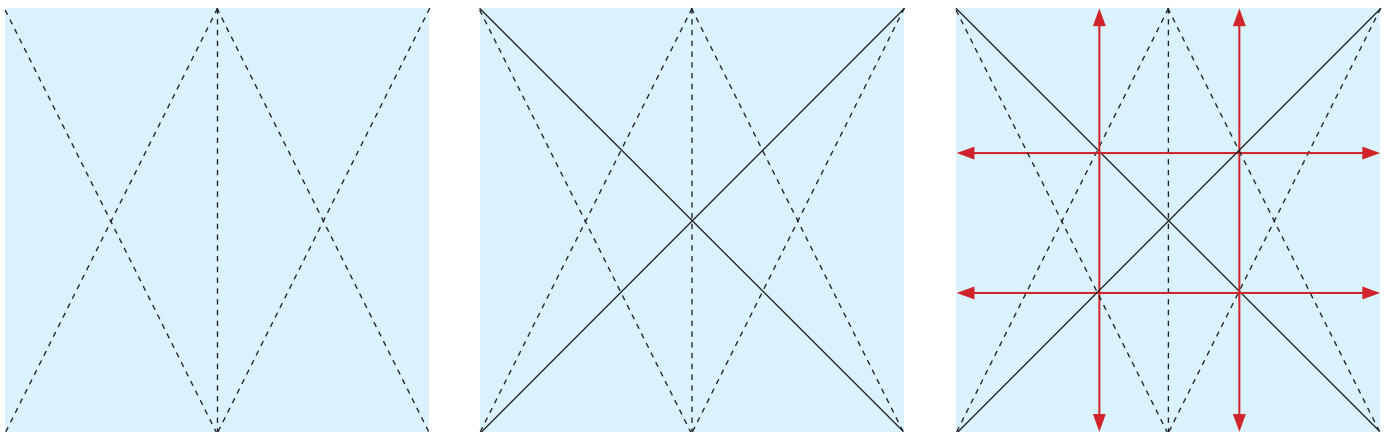
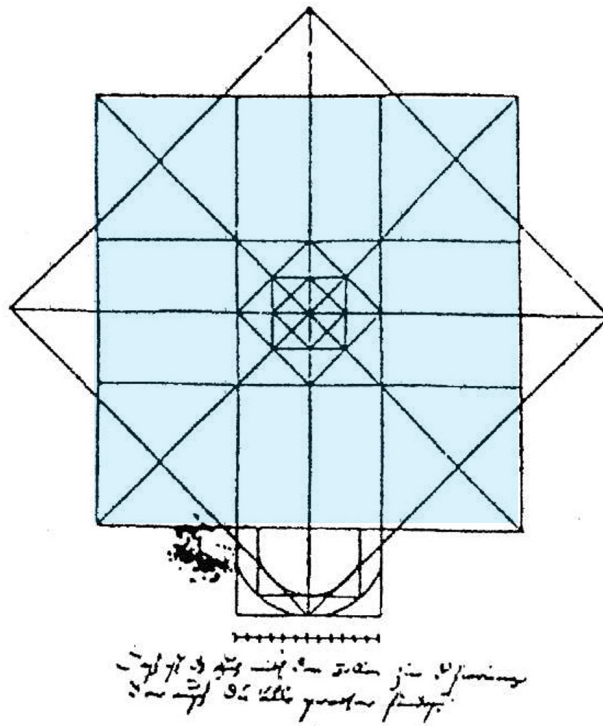


LECHLER'S Mullion Drawing



Laurie SMITH
HISTORIC **BUILDING** GEOMETRY

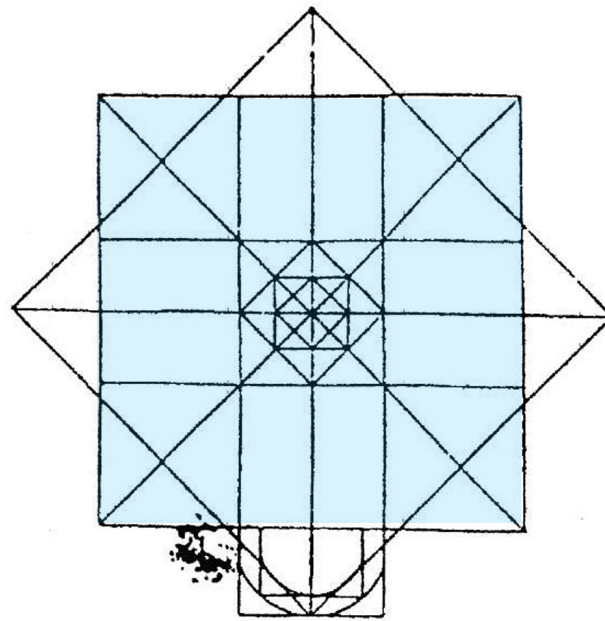


Lechler's Mullion Drawing 1

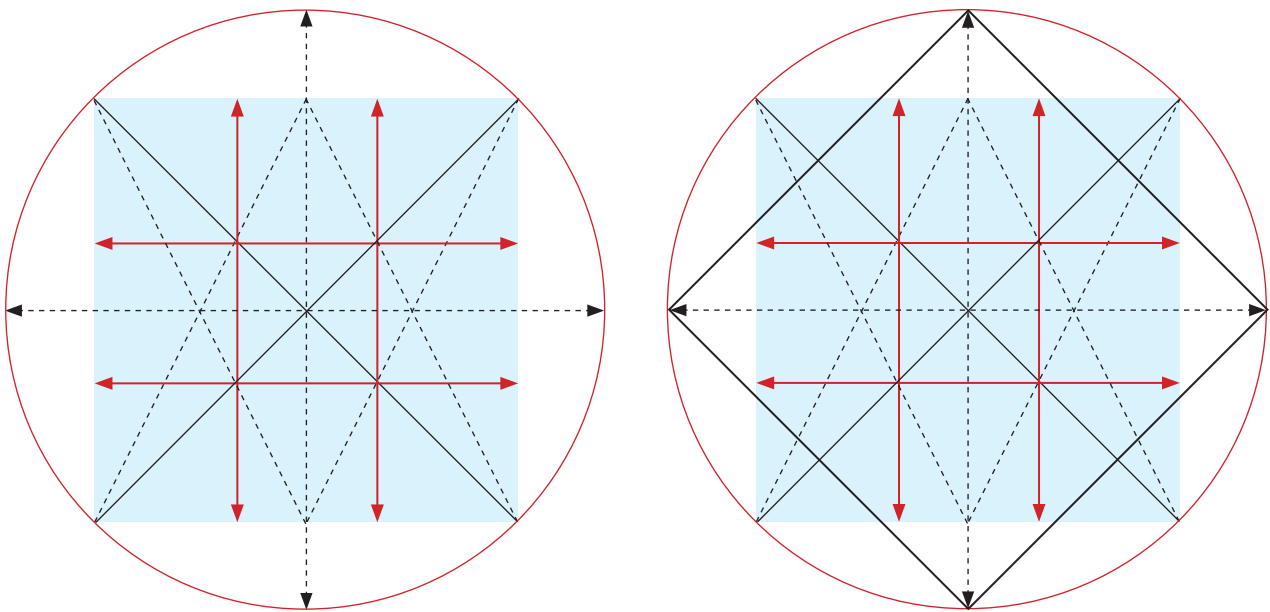
Looking at the square indicated in blue tone first two factors can be observed. First the square is not perfectly square (the blue tone is) and, second, that the square is divided into nine equal small squares.

The three drawings show the stages necessary for division of the square into nine equal small squares. The left drawing shows the square divided into halves with diagonals (this stage can be drawn horizontally if preferred). The central drawing shows the addition of the square's full diagonals (in solid line). The full diagonals intersect the half diagonals at four points. The right drawing shows vertical and horizontal lines (in red) drawn through the four points of intersection to determine the nine equal sectors within the square.

Diminishing whirling squares are drawn within the central square.



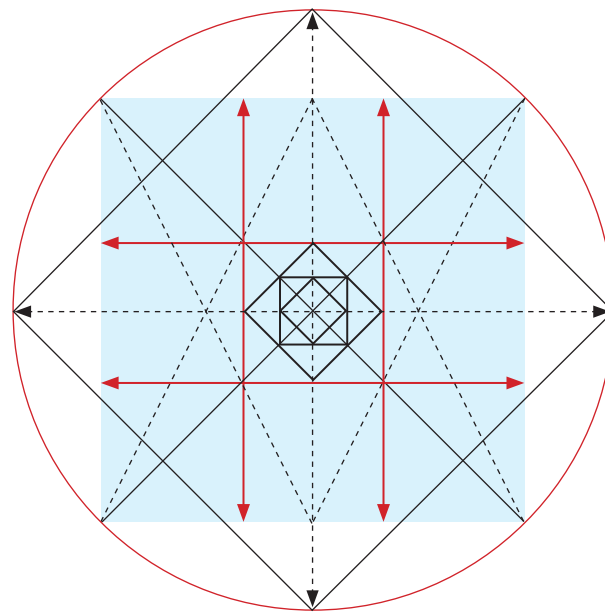
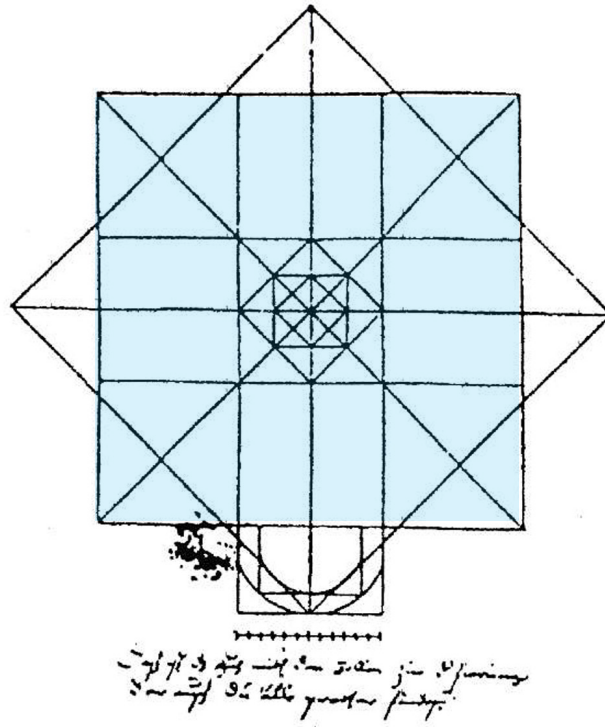
Handwritten Arabic text below the drawing, likely a title or description of the geometric construction.



Lechler's Mullion Drawing 2

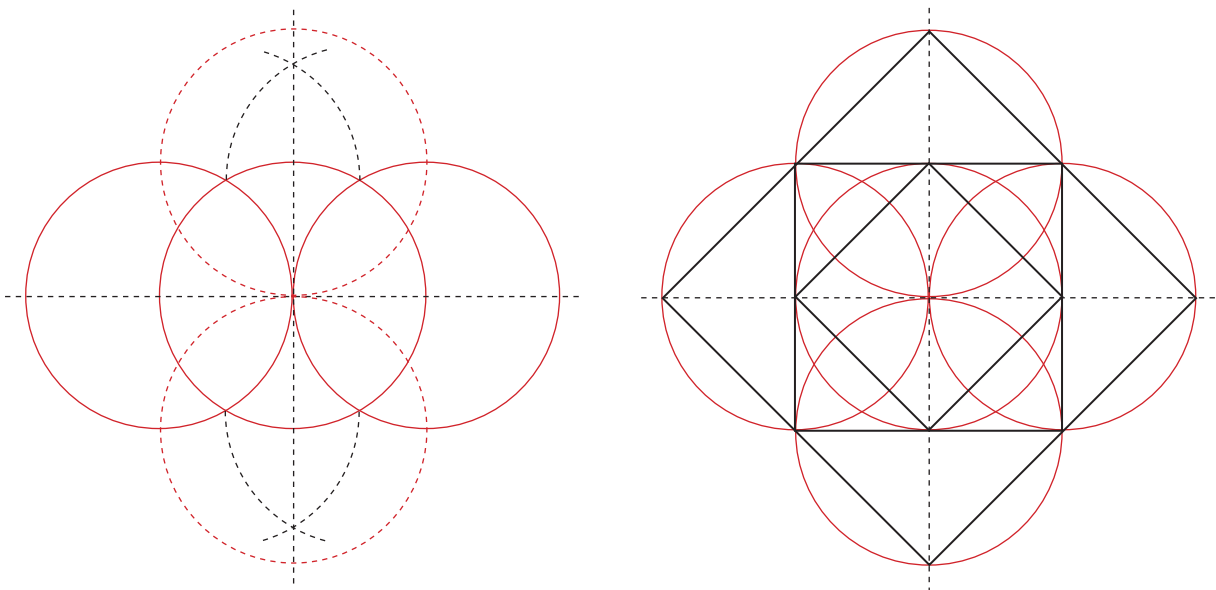
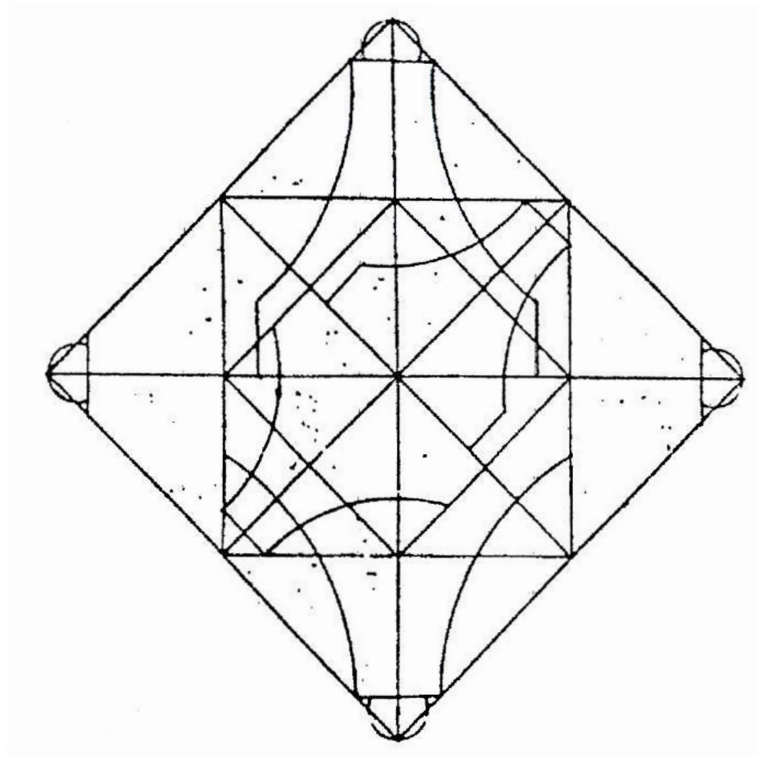
To construct the large diamond (or square at 45°) it is necessary to draw a circle with its axis at the intersection of the first square's full diagonals and its circumference passing through the square's corners. If the first square's vertical and horizontal centre lines are extended to cut the circle they define the corners of the diamond. The square and diamond combine to form an octagon star.

It is noticeable that the octagon star does not synchronise with the division of the first square into nine equal small squares.



Lechler's Mullion Drawing 3

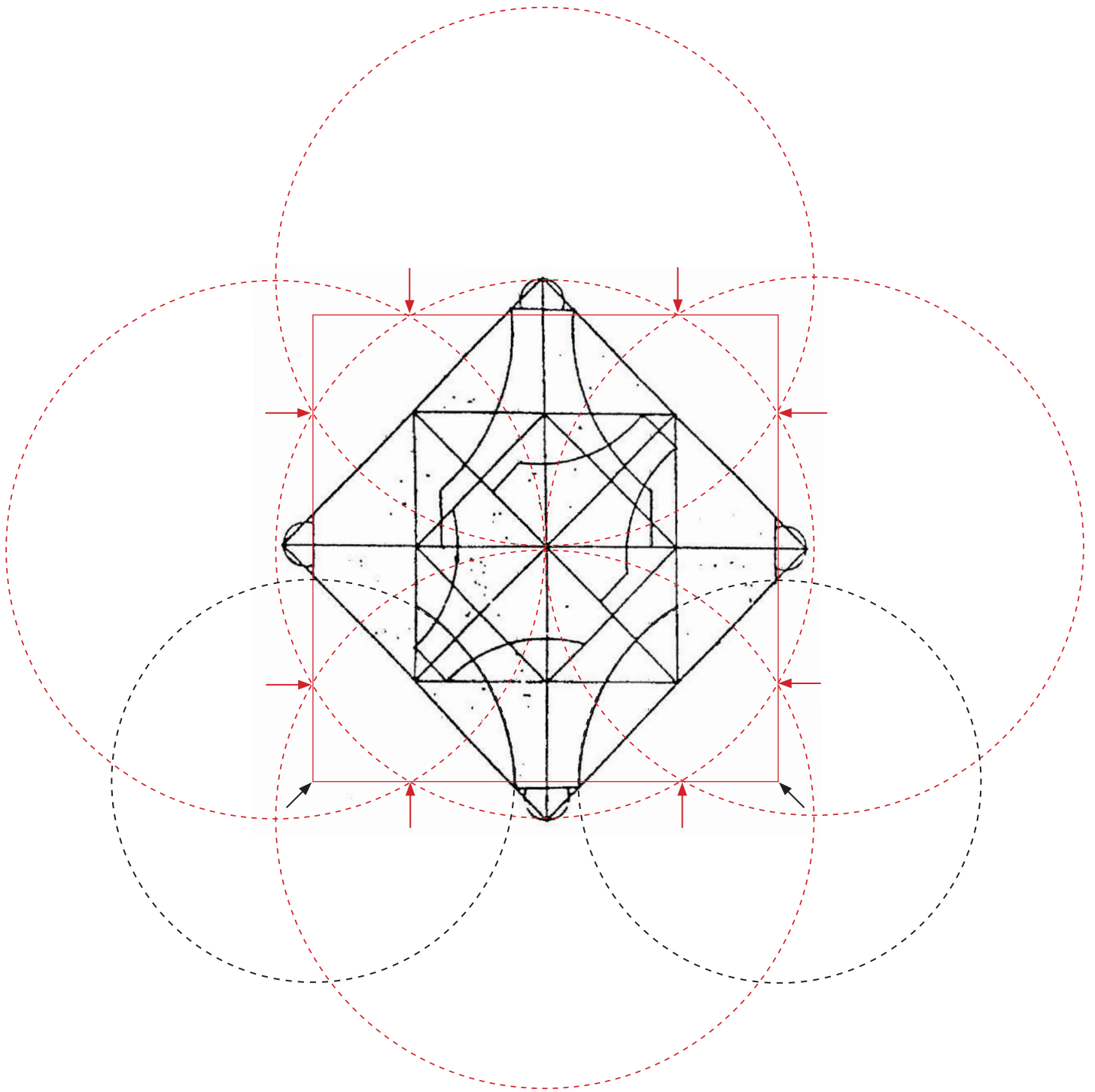
With the octagon star complete, the diagonals of the first square and diamond intersect the corners and sides of the central square of the nine smaller squares. Linking the intersections provides a consecutive series of diminishing whirling squares. The whirling squares are a continuum that expands and diminishes to macro- and micro-infinities. Just four are shown because drawing smaller squares and diamonds rapidly becomes inaccurate and therefore pointless.



Lechler's Mullion Drawing 4

Lechler's whirling squares are most easily drawn using five circle compass geometry. Three circles of equal radius are drawn along a horizontal centre line so that each has its axis on the circumference of a neighbouring circle. The three circles intersect at two points above the centre line and two points below it. Arcs drawn from these points (in dashed black line) intersect to give the location of a vertical perpendicular. Where the perpendicular cuts the central circle (at its north and south poles) two further circles are drawn to complete the five circle geometry.

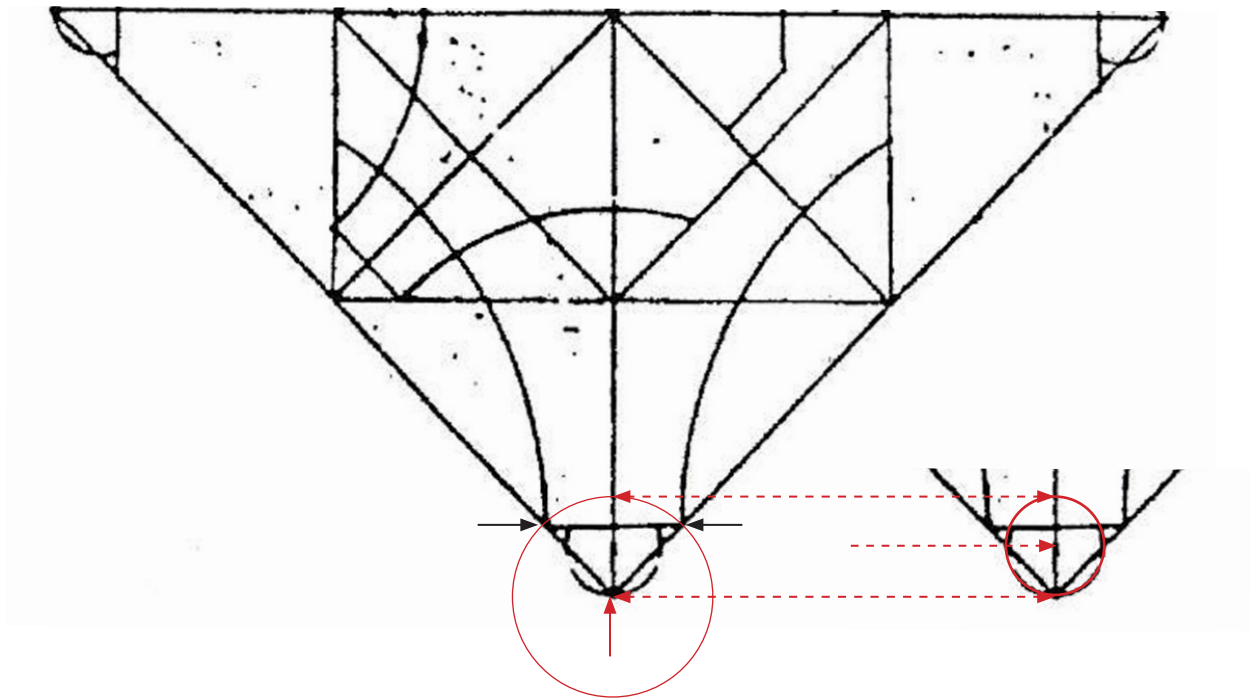
Linking points of intersection enables the construction of three whirling squares (a large diamond, a square and a small diamond).



Lechler's Mullion Drawing 5

Drawing Lechler's mullion arcs can only be attained by constructing a larger five circle geometry from the diamond's central axis and from its four corners. This construction is shown in dashed red line directly over Lechler's drawing (it can be seen that the drawing is not entirely symmetrical but its intention is clear). The five circles intersect at twelve points, eight of which are indicated by red arrows. A square drawn (in red) through the eight points cuts the corners of the diamond and generates the mullion axes at its corners (shown by black arrows). Circles, drawn (in dashed black line) from the axes to pass through the red square where it intersects with the drawing's diamond profile, generate the mullion arcs. This is repeated for the remaining three sides and the process is then repeated within each of the diminishing whirling squares. .

It is clear that Lechler has omitted the underlying compass geometry in order to focus on the resulting form of the mullions for to show both in a single drawing would be visually confusing.



Lechler's Mullion Drawing 6

The small columnar terminals on Lechler's mullions also result from compass geometry. A circle is drawn from the corner of the diamond to pass through the opposite ends of its cut off corner (indicated by black arrows). This circle establishes a bandwidth (marked by dashed horizontal lines) that is halved to generate the axis of the columnar detail (shown on the right). A circle drawn from this axis to equal the bandwidth generates the columnar footprint against the truncated corner of the diamond.

The compass geometry development reveals that nothing is left to chance. Every element of the design is carefully considered, from the greatest to the smallest detail.

In cutting a number of mullions from this design the simplest transition from drawing to stone is through templates.

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