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Bier, Carol

The decagonal tomb tower at Maragha and its architectural context: lines of mathematical thought.

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Summary: Of several brick tomb towers constructed at Maragha in western Iran before the Mongol conquests, one in particular, Gonbad-e Qabud (593 H./1196–97 C.E.), has generated significant recent attention for its unique patterns with pentagons and decagons. Gonbad-e Qabud is also unusual in having a decagonal plan. While both plan and decoration distinguish it from earlier and later towers at Maragha and elsewhere on the Iranian plateau, the ornamental patterns follow a long line of experimentation with geometric expressions that grace many pre-Mongol buildings in Iran. This article examines in particular the overlapping polygons and radial symmetries of the tympanum of the cubic Gonbad-e Sork (542 H./1148 C.E.) at Maragha, and the pentagons and squares of the tympanum of the later octagonal tomb tower (486 H./1093 C.E.) nearby at Kharraqan. Drawing from archival sources (plans, elevations, photographs), analysis of plane patterns, and comparative architectural data, this article reevaluates the cultural significance of Gonbad-e Qabud, seeking to situate it within the histories of mathematics, architecture, and the arts.

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Keywords: algorithm; architecture; art; decagon; dodecagon; geometry; grid; history of mathematics; interlocking; intersecting; Iran; iteration; mongol; Myron Bement Smith; Nasir al-Din Tusi; nonagon; ornament; overlapping; pattern; pentagon; plane; polygon; prism; Seljuk; symmetry; tomb tower
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