

1116-01-1993      **B Lynn Bodner\*** (bodner@monmouth.edu), Mathematics Department, Cedar Avenue, West Long Branch, NJ 07764. *Creating Medieval Islamic Ornamentation*. Preliminary report.

Islamic Art reached its apex during medieval times & the use of repetition to cover surfaces quickly became a main feature. How did medieval craftsmen create these elaborate patterns? There are few written records, but it most likely involved practical geometry & the use of a compass & straightedge. Meetings were held between theoretical mathematicians & craftsmen, & basic geometry instructions were given to artisans. Architectural scrolls also show that polygonal grids may have been used by artisans - the Topkapi & Tashkent Scrolls contain just such repeat unit design sketches. Lastly, a 2007 article proposed that decagonal geometric patterns were reconceived as tessellations of a special set of 5 contiguous tile shapes, each with a unique decorative line pattern. Its authors contend that, "These tiles enabled the creation of increasingly complex periodic patterns, and by the 15th century, the tessellation approach was combined with self-similar transformations to construct nearly perfect quasi-crystalline Penrose patterns, 5 centuries before their discovery in the West." This presentation will provide illustrative examples of all of these approaches for creating geometric Islamic art & then discuss the pros, cons and limitations of each. (Received September 21, 2015)