Nameless Curves

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A circle is defined by a point rotating about another point at a fixed distance, and can be precisely described by the mechanical drafting tool of a compass. This simplicity allows for it to be easily dismissed, within the complexities of contemporary digital work in which a wide variety of curves can be described through software built-in computational processes. However, it is exactly the simplicity of the circle that enabled architects to use it to engender a wide variety of complex forms in the history of architectural drawing. As Robin Evans has pointed out, the orthographic deformations of a circle remain "commensurable" through the direct relationship with a measurable source figure. Circular deformation through orthographic projection allowed for the generation of numerous related and yet "nameless" curvatures whose linear connection to the circle allowed them to be both measured and built.[1] What Evans did not point out, and what was central to the construction of drawings of vaults with cross sectional profiles of "nameless" curvature, was a practice that had much more to do with computation than it did with representation. This practice, as studied in the following work, offers a historical counterpoint to the role of both curvature and computation in contemporary practice.

In the texts of Albrecht Durer, Juan Caramuel Lobkowitz, and Guarino Guarini there appears a wedge shaped figure from Euclid's Elements (300 B.C.E) that defines proportional relationships between distances along intersecting lines.[2] The wedge is a representation of the "intercept theorem" and it allows for a set of divisions along a line to be transferred proportionally to another line that intersects the original.[3] Guarino Guarini utilized the wedge in parallel with orthographic projection to produce a variety of architectural forms. This project explores the historical use of this figure in the two specific operations: the deformation of curves through orthographic projection, and the plotting of points along proportionally related curves that define three dimensional non-spherical surfaces. The first operation allows for the construction of a series of non-circular curves that maintain a connection, through parallel lines, with the flat and measurable source figure of the semi-circle (Figs 1-3). The second operation allows curves produced through the first operation to be developed into three-dimensional surfaces of distinct but proportionally related curvature (Figs 4-5). Importantly, while the first operation of deformation is entirely dependent on orthographic projection, and therefore constructed views of the curves understudy, the second operation produces only distances to points on a surface from a fixed center. This second operation was required to develop Evans's "nameless" curves into three-dimensional architectural surfaces, and points to an alternate history of architectural drawing in which orthography is at times superseded by drawing techniques that rely on computation. Furthermore, it begins to suggest the manner in which historical drawing practices do not simply precede contemporary practices in a linear history of representational progress. Instead they can be seen as conceptually and operational related practices, that rely on different tool set and media for their realization.

ENDNOTES

1. Evans, Robin. "Translations from Drawing to Buildings." In Translations from Drawing to Building, 153–89. Cambridge: MIT Press, 1997.

2. See for example: Caramuel Lobkowitz, Juan. (1678). Architectura Civile Recta y Obliqua. Vigevano: Camillo Corrado. Durer, Albrecht. (1977). The Painters Manual. Translated by Walter Strauss. New York: Abaris.. Guarini, Guarino. (1737). Architettura civile. Turin: G. Mairesse.

3. Field, J.V., and J.J. Gray. (1987). The Geometrical Work of Girard Desargues. New York: Springer Verlag.

FIGURE 1: Twenty elongations of a semi-circle along a single axis.

FIGURE 2: Twenty elongations of a semi-circle along two axes.

FIGURE 3: Twenty deformations of a semi-circle along a folded plane

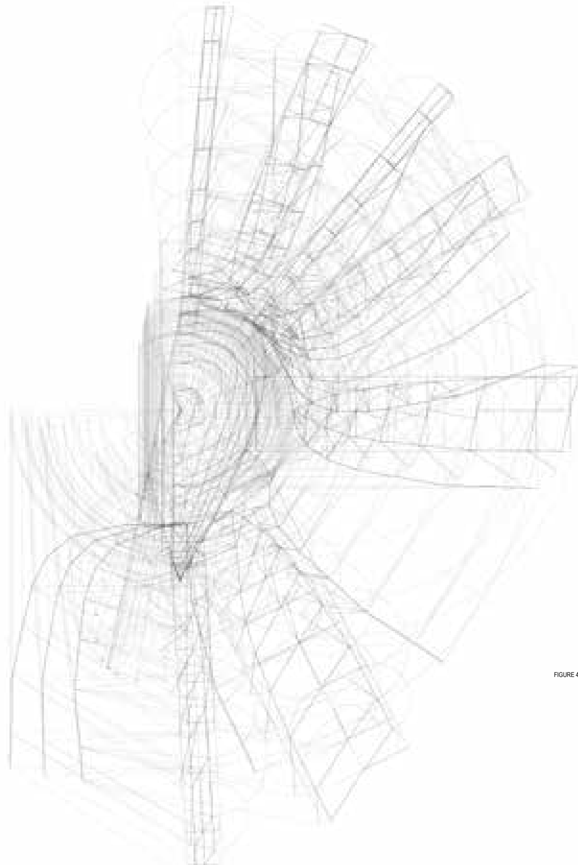

FIGURE 4: Euclid's wedge and a vault of parabolic curves.

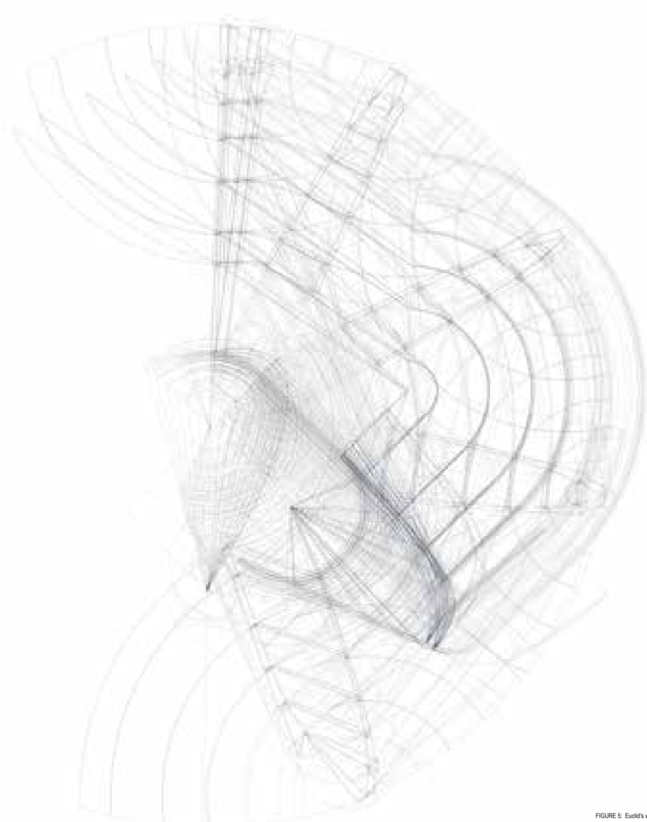

FIGURE 5: Euclid's wedge and a vault of nameless curves.