Kim Williams | *Letter from the Editor*

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Abstract. *NNJ* Editor-in-Chief introduces *Nexus Network Journal* volume 13 number 2 (Summer 2011).

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Following the seventh edition of the conference series "Nexus: Relationships between Architecture and Mathematics" (San Diego, 2008), it was decided that papers presented at future editions of the conference would no longer be published in separate volumes as conference proceedings, but would be appear instead in the *Nexus Network Journal*. Thus the papers presented at the eighth edition of the Nexus conference (Porto, 2010) are being published in the three issues of this present vol. 13. The first group appeared in the first issue (Winter 2011), dedicated to "Shape and Shape Grammars", under the direction of Lionel March. This present issue, Summer 2011, contains papers presented during two sessions moderated by myself and Sylvie Duvernoy. The final issue of this year, Autumn 2011, will contain papers presented during two sessions directed by José Calvo Lopez (From Mediaeval Stonecutting to Projective Geometry) and Gonçalo Furtado (Architecture, Systems Research and Computational Sciences).

The two sessions included here comprised presentations dedicated to a wide range of subjects rather than one specific topic, and represent the kind of variety that has always characterized Nexus conferences, while at the same time making evident the many ways in which what seem to be very different topics are intertwined. I have entitled this issue "Qualitative and Quantitative Architecture and Mathematics." And what a rich variety it is! The issue opens with papers by two of the three keynote speakers. Lino Cabezas provides an in-depth examination of "Ornamentation and Structure in the Representation of Renaissance Architecture in Spain", and Chris Williams discusses "Patterns on a Surface: The Reconciliation of the Circle and the Square." At first glance, these two themes could not appear more antithetical, the one dealing with perspective analyses of decorated surfaces in paintings, and the other with a numeric method for tiling a curved surface by relaxing a grid over it. However, in his own way each author is dealing with the application of geometrical shapes on architectural surfaces. (The third keynote speaker at Nexus 2010 was Eduardo Souto de Moura, winner of the 2011 edition of the Pritzker Prize, whose works speak for themselves regarding the connection between architecture and mathematics.)

Three of the papers included in this issue concern housing. Marco Giorgio Bevilacqua presents "Alexander Klein and the *Existenzminimum*: A 'Scientific' Approach to Design Techniques", showing how rigorous mathematical methods of analysis were used to develop standards for decent housing for the working class. In "The Octagon in the Houses of Orson Fowler", Eliseu Gonçalves looks at how the same search for decent, comfortable and affordable housing led American phrenologist Orson Fowler to champion the octagon as the ideal shape for a house. This ties into the theme of the Geometer's Angle column in this issue, "Thomas Jefferson's Poplar Forest", where with her usual care geometer Rachel Fletcher uses the original plan for Jefferson's octagonal house to highlight the use of root-two proportions in its design.

Moving from the domestic scale to that of the city, two of the papers here deal with urban design. In "Measuring Lisbon Patterns: Baixa from 1650 to 2010," Teresa Marat-

Mendes, Mafalda Teixeira de Sampayo and David M.S. Rodrigues present the results of a mathematical-urban analysis of the evolution of Lisbon's historic Baixa district over the course of 350 years. In "Dynamics of Urban Centre and Concepts of Symmetry: Centroid and Weighted Mean", Jong-Jin Park introduces the concept of the programmatic moving centre in order to use the mathematical methods of analysis of centroid and weighted mean to describe the generation of urban form.

It hardly bears repeating that scientific thought in Renaissance and Baroque periods had an enormous influence on architectural theory. Documentary evidence of this is found in both written treatises and built work. Three papers in this issue are concerned with the sixteenth, seventeenth and very early eighteenth centuries. In "From Quantitative to Qualitative Architecture in the Sixteenth and Seventeenth Centuries: A New Musical Perspective", Vasco Zara examines the 1499 *Hypnerotomachia Poliphili* and the 1679 *Architecture Harmonique* in support of a new interpretation of the use of proportion and a transition between two differents concepts of architecture that took place in the sixteenth century. In "Renaissance in Goa: Proportional Systems in Two Churches of the Sixteenth Century" António Nunes Pereira presents the results of geometric and proportional analyses of two churches to demonstrate the use of Renaissance proportional systems in Portuguese India. But the new science of perspective that was developed beginning in the fifteenth century brought with it an awareness of the contrast between true proportion and visual perception. João Paulo Cabeleira Marques Coelho, in "Inácio Vieira: Optics and Perspective as Instruments towards a Sensitive Space", discusses two early eighteenth-century treatises by the Portuguese Jesuit scholar in which he searches for *prós opsin euruthmia* (proportion in agreement with visual impression).

Completing this issue are three fascinating research papers and a book review. In "Making a Difference," archaeologist Lone Mogensen proposes a theory about how the ground plans of medieval churches were initially staked out. Michael Ostwald presents the first of a two-part study (the second part to appear in the next issue of the *NNJ*) entitled "The Mathematics of Spatial Configuration: Revisiting, Revising and Critiquing Justified Plan Graph Theory" in which he provides a history, explanation and worked example of analysis using JPG. As he did in his earlier study of applications of fractal theory to architecture (*NNJ* 3, 1 (2001): 73-84), one of the most widely read articles ever published in our journal, Michael steps back and looks at the subject to present an overview that is both dispassionate and rigorous. Bernard Parzysz points out interesting solutions for transitions between geometric shapes in "From One Polygon to Another: A Distinctive Feature of Some Ottoman Minarets". Finally, Book Review Editor Sylvie Duvernoy reviews *The Mathematical Works of Leon Battista Alberti*, a book about which I happen to know a great deal, since it is the result of a two-year effort on the part of Stephen Wassell, Lionel March and myself to compile translations and commentaries of four mathematical works by the great Renaissance polymath.

As always, it is an honor and privilege to present such a fine group of papers. Happy reading,

Kim Williams