LETTER FROM THE EDITOR

Volume 2 (2000) of the *Nexus Network Journal* is the permanent archive in print of material first published on the *NNJ* website during the calendar year 2000. Since its first issue published online in January 1999, the *NNJ* is growing and developing. Before introducing the papers in this current volume, I'd like to share some of the new developments.

In May 2000 the *NNJ* moved to its own domain on the Internet, at the URL

<http://www.nexusjournal.com>

The move to its own domain is one sign of the growth of the journal. Other signs of growth are found in its growing mailing list, now registering over 325 names, and in the number of "hits" or visits to the site each month, which averages 34 per day, for a total of over 1000 per month. This is up from 24 per day or 750 per month since we opened the new domain. Visitors come to the site from all over the world, proof that the interest in architecture and mathematics is of international and intercultural interest.

In addition to its growing distribution, there are other new features in the *NNJ*. This year we added a "Didactics" column. This features reports on courses that have featured architecture and mathematics as part of their academic agenda. Student work is shown, with teachers' comments on the project aim and scope. This column will also be featuring helpful material for all teachers such as course outlines and reading lists, as well as reports on current academic requirements for mathematics in architecture faculties. One of the aims of the *NNJ* is to foster an adequate mathematics education for architects, and the Didactics column is aimed at providing concrete teaching aids in this respect. It is particularly exciting to me that the projects featured in this current volume are about student projects at the high school or superior school level. These lessons about the built environment, adding a knowledge of architecture to the knowledge of mathematics that they have already acquired, are bound to increase students' awareness of the world in which they live.

Another new feature of the *NNJ* that begins with the present volume is the column entitled "The Geometer's Angle" by geometer and artist Mark Reynolds. This column will appear in each quarterly issue of the *NNJ* online. Mark will be presenting geometric constructions with step-by-step instructions and illustrations. The purpose of the column is to put together an archive of material on geometry that becomes, like the *NNJ* itself, an important research resource.

A very special feature of the present volume is the addition of a CD. Slavik Jablan, editor of the electronic journal *VisMath* (<http://www.mi.sanu.ac.yu/vismath/>), has contributed an interactive game about tiling called "Modular Games". The program, which is witty and graphically sophisticated as well as instructive, is designed to let you create patterns while teaching you how they work. Donald W. Crowe, who with Dorothy Washburn co-authored *Symmetries of Culture: Theory and Practice of Plane Pattern Analysis* has written an "Introduction to Slavik Jablan's 'Modular Games'", providing us with a background of information about Slavik's program.

To open this volume, Denes Nagy presents a viewpoint, "Architecture and Mathematics: From an Odd Couple to a New Partnership. Indeed, the world of interdisciplinary studies has opened up in recent years, fostering a new dialogue between our two fields.

It is often believed that the key to understanding Greek architecture is the Golden Mean. But is it? At the Nexus '98 conference, Marco Frascari and Livio Volpi Ghirardini provoked a heated debate with their criticism of the cult that surrounds ϕ . Michael Ostwald, book review editor of the *NNJ*, examines the ϕ debate in "Under Siege: The Golden Mean in Architecture".

But even while scholars debate whether or not the Greeks used the Golden Mean as a tool, it appears that the lack of mathematical references, and in particular, the lack of pattern, in contemporary architecture is depriving us of a fundamental requirement for our intellectual development. Terri Mikiten, Nikos Salingaros and Hing-Sing Yu examine the function of pattern in pavements in their article "Pavements as Embodiments of Meaning for a Fractal Mind". Pavements of the past were richly patterned using intricate designs and precious stones. But many architects today don't use patterns in their designs because they are not taught in architectural schools. And some architects are simply intimidated by mathematics. One solution for both of these obstacles is Paul Calter's paper "How to Construct a Logarithmic Rosette (Without Even Knowing It)". Taking as a point of departure an article on "Spirals and Rosettes in Architectural Ornament" in the *NNJ* vol. 1 (1999), Prof. Calter explains a step-by-step procedure for physically, not geometrically, constructing the rosette pattern that was once a common pavement pattern. One contemporary artist who is not intimidated by pattern is Tess Jaray. An abstract artist working in London, Tess applied the kinds of patterns found in her canvases to pavement design. Kim Williams reports on these in "Environmental Patterns: Paving Designs by Tess Jaray".

While some architects are intimidated by mathematics, others are simply inspired. Those who love shape will love Martin Euser's "Pythagorean Triangles and Musical Proportions". In volume 1 of the *NNJ*, triangulation in the architecture of Andrea Palladio was discussed by Vera W. de Spinadel. Martin Euser's article provides more material on the properties of the special Pythagorean triangles. Kazimierz Butelski also examines the issue of shape in his paper, "The Architecture of Curved Shapes". With the advent of computer-aided design and drawing (CADD), it is possible to make architecture in any shape imaginable.

Jay Kappraff, known to many of you as the author of the book *Connections: The Geometric Bridge Between Art and Science*, has contributed "The *Arithmetic* of Nicomachus of Gerasa and its Applications to Systems of Architectural Proportion". The theories of this ancient author traveled across the centuries to surface in the architecture of Leon Battista Alberti and Le Corbusier. The search for a method to square the circle occupied the mathematicians in Nicomachus's age. Helmut Sander exhibits "A Geometrical Ensemble to Generate the Squaring of the Circle".

Tools are an important part of the architecture trade. Nancy Wu originally published "Hugues Libergier and His Instruments" in the *Avista Forum*, the Journal of The Association Villard de Honnecourt for the Interdisciplinary Study of Medieval Technology, Science and Art. I am very pleased to reprint this paper here, so that *NNJ* readers who aren't medievalists will be able to learn from it. I am always reminded of the story about how the earliest paper on chaos theory didn't find its way to mathematicians because it was originally published in a journal for meteorologists. In spite of the new interdisciplinarity that is popular today, many papers such as Dr. Wu's still may not find their way to all interested readers. But drawing instruments and construction tools are not the only tools the architect has: a building itself

can be a tool. Could this be the case of the Pantheon in Rome, which some theorists believe to be an astronomical instrument? Giangiacomo Martines examines this issue in “The Relationship Between Architecture and Mathematics in the Pantheon”.

The round table discussion at Nexus 2000 is also published in this volume. An important addition to the Nexus conference, this round table, moderated by Carol Martin Watts, was entitled “Methodology in Architecture and Mathematics”. What becomes clear in this transcript are the varying points of view held by each discipline, even about matters as apparently clear as definitions.

The present volume is as rich in book reviews as in research. Abdul Karim Bangura, currently Director of the African Institution in Washington, DC, reviews Ron Eglash's *African Fractals: Modern Computing and Indigenous Design*. Alessandra Capanna, who presented “Conoids and Hyperbolic Paraboloids in Le Corbusier's Philips Pavilion”, reviews Manfredi Nicoletti's *Sergio Musmeci: Organicità di forme e forze nello spazio*. Musmeci's search for form is very much like that of Buckminster Fuller, the subject of the book *Your Private Sky. Buckminster Fuller*, reviewed by Kim Williams. Alessandra also reviews the monograph *Le Corbusier 1910-65*. Musical proportions are considered so key to the understanding of Renaissance architecture that the topic turns up again and again. Robert Tavernor's latest book *On Alberti and the Art of Building* provides an examination of all facets of Alberti's rich architectural patrimony. Stephen R. Wassell's review of Branko Mitrović's translation and commentary of Vignola's *Canon of the Five Orders of Architecture* is really more than a review; it is a survey of all the previous English editions of Vignola's classic treatise. Mark Peterson has undertaken the review of Lionel March's new *Architectonics of Humanism*, which contains a wealth of information about the relationships between architecture and numbers. Jay Kappraff reviews Cecil Balmond's exaltation of numbers, *The Number 9: The Search for the Sigma Code*. Gert Sperling's review of “*Ich aber quadriere den Kreis...*”, an examination of Leonardo's squaring of the circle in his famous illustration of the Vitruvian Man, is a good complement to Helmut Sander's article on that geometrical quest. Kim Williams reviews Benno Artmann's *Euclid. The Creation of Mathematics*.

The *NNJ* records also the year in conferences, with reports by Timothy Brown, Yvonne Dold-Samplonius, Holger Falter, Orietta Pedemonte, Ivars Peterson, Vera W. de Spinadel and Kim Williams.

Finally, we publish here the updated “Virtual Library”, the annotated bibliography of books related to architecture and mathematics.

In closing, I thank our sponsors, the Graham Foundation for Advanced Studies in the Fine Arts, a grant from whom makes possible this print version of the *NNJ*, and the Sesa group of Empoli, who hosts the *NNJ* domain on their server.

Kim Williams, Editor in Chief