

UNSTAKED TERRITORY: Frontiers of Beginning Design

Proceedings of the 19th National Conference on the Beginning
Design Student, Oklahoma State University, Stillwater, Oklahoma
April 3-5, 2003



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Challenging The Boundaries I
Challenging The Boundaries II
Integrating The Boundaries
Obscuring The Boundaries
Various Terrains
Initial Terrain

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Kit-of-Parts-in-the-World

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The pedagogy of the first two semesters of undergraduate design studio are perhaps the most difficult to conceive and implement because they stand at the threshold to a new conception of viewing and interpreting the world. Most foundation studio programs are predicated on the assumption that new students come to a design curriculum with cultural preconceptions about design that need to be, at least temporarily, forgotten.

The tendency of beginning students is to rely on notions of architectural quality they have learned by exposure to the mainstream media, such as film, television and shelter magazines. Received images of domestic and public space are then interpreted based on the prevalent tastes and class aspirations of a student's particular cultural milieu. Upper middle class students from the west side of Manhattan will come to architecture programs with their tastes more closely in line with the tastes of students and instructors of architecture programs than students from lower middle class suburban communities. Perhaps at a superficial level, *Dwell* and *Metropolitan Home* better prepare beginning architecture students than *Architectural Digest*, since they imply general ground rules for acceptable architectural and decorative vocabularies.

Whether *Dwell* or *Digest* provides the first introduction to design culture, architecture is initially understood as a vehicle of lifestyle differentiation from peers or class. Students unfettered by a pedagogical structure will think about design in terms of 'amenities', such as fancy kitchens, Jacuzzis, and loft mezzanines, or in terms of iconography and symbol such as pitched or domed roofs, highly decorative front doors, and Palladian picture windows. Most design schools eliminate the possibility of relying on these preconceptions by teaching beginning design with a series of exercises that keep these issues and desires at bay.

From the late 1970s until the early 1990s, the most common studio exercise for redirecting the issues of design was the kit-of-parts problem. By reducing the possible design solution to a reductive and abstract set of elements, such as 'walls-as-planes' and 'piers', the student is encouraged to think about abstract spatial relations. Other issues, such as the relation between function/program and form, the relation between iconography/symbol and form, and the relation between construction technique and form are eliminated. More significantly, the kit-of parts problem deflects attention away from the reason for architecture-to-be-in-the-world (lifestyle differentiation, for example) by focusing attention on the principles of architecture itself as an autonomous discipline. The classic example of the kit-of-parts is the 9-square grid problem and its progeny, first developed by John Hejduk at the University of Texas in the mid-1950s.¹

The terms of the 9-square grid problem were influenced by a specific pedigree of art and architecture history that had evolved immediately after the Second War. A primary protagonist was Rudolf Wittkower who had published important essays on role of geometry in the works of Alberti and Palladio while a member of the Warburg Institute in London. These essays would later be collected in *Architectural Principles in the Age of Humanism*, which was first published in 1949 and again in 1962.² The book includes the chapter "Palladio's Geometry: the Villas," in which Wittkower argues that similar organizational schema unifies all of Palladio's villas. Significantly Wittkower's diagrams of the villas are variations of a 3-bay by 3-bay diagram – a 9 square grid. Wittkower suggests that Palladio's villas can be considered as a single conceptual project based on variations of an ideal plan diagram:

"What was in Palladio's mind when he experimented over and over again with the same elements? Once he had found the basic geometric pattern for the problem 'villa,' he adapted it as clearly and as simply as possible to the special requirements of each commission. He reconciled the truth at hand with the 'certain truth' of mathematics which is final and unchangeable".³

The idea that the plan diagram itself could a subject of critical inquiry was made relevant within the context of post-war architectural theory with the publication of Colin Rowe's essay *Mathematics of the Ideal Villa* (1947).⁴ Rowe had been a student of Wittkower's at the Warburg Institute from 1945-47. In the article, Rowe extends Wittkower's analysis of the grid/bay by comparing Palladio's Villa Malcontenta with Le Corbusier's Villa at Garches. The essay serves as both a historical legitimization of Le Corbusier's oeuvre and a reassertion of Wittkower's dialectic between the ideal concept of the plan diagram and the specific elaboration of the plan. Some of the original audaciousness of the essay can be imagined if one realizes that Rowe compared Palladio to an architect at the prime of his career; the essay was written before Ronchamp, Ahmedabad, Chandigarh, and La Tourette.⁵ While ostensibly a historical analysis, Rowe's essay reads in hindsight as a thinly veiled argument for an architectural agenda based on a negotiation between the ideal terms of the diagram and the messy circumstance of the program.

Another important influence on the 9-square grid problem was Rudolf Arnheim, an art historian who had developed a theory of the psychology of form based on the principles of German gestalt theory. In his seminal book, *Art and Visual Perception* (1954),⁶ Arnheim uses a method of analysis that deploys a wide variety of art historical examples to illuminate specific compositional strategies; a method of comparative analysis that is structurally similar to Rowe's analysis of Malcontenta and Garches. When considered within the framework of gestalt theory, the 9-square grid was the ideal geometric format to understand the interrelation between pier/column and wall because the format inherently includes 'center', 'edges', and 'corner's within its neutral framework. The attributes of the grid thus bear an explicit relationship to the geographic locations that Arnheim articulates in *Art and Visual Perception*. Spatial elaboration within the framework of the 9-square, made possible by the addition of walls, is therefore established against the background (field) of the natural hierarchy of the pre-existing grid.

Since the architectural elements that make up the 9-square grid exercise were meant to be abstract, compositional decisions were meant to focus on the spatial figures (or implied spatial figures) that resulted from the placement of walls within the framework of piers. Spaces were defined, not by complete and unambiguous enclosure, but rather implied by the correspondence of the edges of elements. The definition of space through inference encouraged minimal means to affect a spatial figure. This strategy also permitted the simultaneous definition of several interpenetrating spaces. As such, the 9-square grid problem became the ideal vehicle to explore the theory of spatial relations articulated in Colin Rowe and Robert Slutzky's seminal essay *Transparency: Literal and Phenomenal*.⁷ Significantly, Rowe, Slutzky, and Hejduk were all teaching at Texas when the essay was written and published.

With both Arnheim and Rowe/Slutzky providing the conceptual underpinning for the motives of the kit-of-parts design exercise, the focus of the projects were clearly established. Instead of starting with a program or verbally articulated set of intentions (a brief) from which a design was then to be developed, the kit-of-parts problem made composition and the elaboration of a compositional schema the motive for design. "Spatially complex rather than simplistic" became the paradigm for design development and critique. Architectural composition explored within the format of the design exercises was understood against the cultural history of compositional strategies as demonstrated in art and architectural history.

In addition to spatial elaboration, the 9-square grid problem also established the plan diagram as the conceptual underpinning of an architectural work. Both Wittkower and Rowe had introduced a method of formal analysis whose aim was the reduction of a work of architecture to a geometric schema typically represented in plan. With the 9-square grid, Hejduk had developed a design methodology in which the diagram could be a starting point for the kinds of spatial elaborations that Rowe and Slutzky championed. To clarify the theoretical underpinning of the new pedagogical focus, Hejduk designed a series of houses that explore the rich variety of spatial relations that were possible within the perceived constraints of the 9-square grid exercise. The so-called 'Texas Houses' are presented as variations of a single idealized diagram; as such, they bear a strong resemblance to Wittkower's diagrams of the Palladian villas.

The Texas Houses acknowledge the link to the history of enduring architectural principles by embracing the primacy of the plan diagram. In addition, and more significantly, the houses tend to deploy the architectural grammar and compositional tactics of Mies van der Rohe (and to a lesser extent, Le Corbusier), establishing for the first time in the academy a self-conscious rather than a casual acknowledgement of a prevalent modernist canon within the structure of a design curriculum.⁸ This is evident both in their spatial character and the precise syntactic relation between pier, wall, and furniture. The systematic representation of pre-existing architectural languages is consistent with the role that the analysis of historical precedent played in the new curriculum at Texas. The implication was that architecture was a language-to-learn, suggesting a pedagogical emphasis that was distinct from the problem-solving methodology developed by Gropius at Harvard.

It is significant to note that the emphasis on the transformation of the plan diagram and the elaboration of space had the reciprocal effect of de-emphasizing the facts of construction, detail, and the quality of materials. What began as a set of exercises with a bias towards a Miesian language, ended up favoring the less material-specific Corbusier of La Roche/Jeanneret, Garches, Ahmedabad, and La Tourette. In House 4 of the Texas Houses, the physical characteristics of the H column results in specific wall thicknesses and details that are related to the width and thickness of the column flange. This level of articulated resolution of building elements ran against the spatially biased agenda of Rowe and Slutzky. As a result, a Miesian language that could balance spatial elaboration with the syntactical elaboration of the construction joint was ultimately replaced with Corbusier's free plan. In Corbusier's vocabulary of the 1920s, round columns and walls come tantalizingly close but rarely touch, resulting in a lack of need for syntactical resolution at their intersection. With this language of elements, walls and columns can more purely operate as instigators of a spatial agenda, better servicing the larger pedagogical goals of the kit-of-parts exercise. An emphasis on space and complex compositional strategies finally favored the 'white' architecture of both Le Corbusier and Giuseppe Terragni, who was 'discovered' by Peter Eisenman and added to the canon in the early 1970s.⁹

The 9-square grid and its progeny can be considered formative in the redirection of pedagogy in American architecture schools, although it was not a pervasive until the late 1970s with the diaspora of the graduates of Cornell, Syracuse, Princeton, and Cooper Union to an ever-widening number of architecture programs. The growing popularity of kit-of-parts design exercise both encouraged and reflected the general return to autonomy in the discipline of architecture in the late 1960s and 1970s; manifested in the work of Aldo Rossi and the *Tendenza* movement in Italy and the New York Five (including John Hejduk and Peter Eisenman) in the United States. While the influence of the kit-of-parts exercises can be considered positive within the trajectory of avant-garde practice, the specific attributes of the problems can also be criticized for what they did not encompass and their possible legacy in mainstream practice in America.

While the kit-of-parts problem refocused design education on the definition and articulation of space, and the enrichment of the 'architectural promenade' (achieved with spatial elaboration), the exercises most decidedly de-emphasized the material aspects of architecture and the role of 'program' in helping form an architectural project. If the kit-of-parts exercise became de rigueur in American architecture schools in the mid to late 1970s, perhaps their pervasiveness as a methodology for design thinking can be partly attributed to the change in emphasis in American architecture in the 1980s from an architecture based on material expression and 'big-move' platonic geometries (as typified by the work of I.M. Pei) to an architecture based on the elaboration of the plan diagram generated from a response to contextual conditions and typological precedent. The material and construction facts of building were no longer part of the architectural agenda. Facades, instead, were meant to mimic or comment on the context of the building but not be generated from a tectonic argument.

The Wexner Center at Ohio State University by Peter Eisenman is an example of a building that exhibits characteristics motivated by the framework of the kit-of-parts problem. It is a spatially complex building that completely discounts the material facts of the architecture except at the level of sign. The rich overlap of spaces, whether implied by frames or planes are all defined by painted gypsum board and off-the-shelf acoustic ceiling systems. Brick is selectively deployed to connote pre-existing buildings on the site (in a series of faux ruins), but not for its inherent material qualities. The program content of the building is not the driver of design development; rather the form of the building is a result of the selective mapping of physical forces on the site, resulting in an itinerary that is choreographed both outside and inside the building. The argument for the overlap of competing spatial systems is generating by two axes that exist on the campus. The program/content and the constructional logic play no role in the formation of the architecture.

Whether the underlying motives of the kit-of-parts exercise can be blamed for the worst excesses of post-modernism can be debated, but several new beginning design exercises were developed in the late 1980s and early 1990s that competed with the kit-of-parts problem as the primary method for teaching students a new language (while encouraging them to drop their cultural preconceptions about the discipline).

The first were a category of exercises that can be loosely identified as "Learning by Making"; exercises that began with the selection of specific materials. In this genre of studio problem, students are encouraged to discover design potential in the properties of material themselves, both in terms of their inherent character ('translucency', for example) but also in terms of how they can be assembled or aggregated to create architectural scale. These studio problems became popular during the late 1980s and early 1990s, when the academy began to lament the loss of 'authenticity' in American architecture. It was also a period when model making became more homespun and 'authentic' in architecture studios. Instead of representing buildings 'to scale' in carefully detailed basswood, students favored models built of poured plaster and found materials. They were meant to be as much art objects as representations of a future built reality.

An emphasis on material research was also generated by the implementation of more rigorous criteria for tenure review in University architecture departments. Design generalists could no longer satisfy the scrutiny of non-architects in the academy merely with 'design research' in practice. Separate 'defendable' research agendas were required for tenure, forcing design professors to choose between either a more scholarly history/theory path or more scientifically grounded material research agenda. Architecture programs are still adjusting to the resulting professionalization of the academy and the phasing out of the practicing architect/design instructor as the primary protagonist in design education.

The second category of new foundation exercise was predicated on the idea of narrative as a driver of architectural elaboration. Perhaps this genre of exercise was the result of the latent significance of the architectural promenade as the motive for spatial elaboration in the classic kit-of-parts problem. In the kit-of-parts project, however, the itinerary of the spatial sequence is only motivated by the spatial clues, creating a tautology of intention and effect that could never quite satisfy in the purest manifestations of the genre. What was missing was a juicy story that could drive the content of the promenade and thus, the spatial effect. Maya Lin's Vietnam Memorial was the ideal example of the possibilities of narrative to provide fuel for an abstract architectural solution. With the Challenger Space Shuttle

Memorial competition in the late 1980s, the memorial became a popular design problem because it encouraged consideration of 'Big Ideas' in the academy. A series of holocaust memorial competitions, the Oklahoma City Memorial, and Daniel Libeskind's Jewish Museum in Berlin have further popularized studio problems based on the memorial. The grief of September 11 and the subsequent process to choose an appropriate response (and team) to redevelop Ground Zero has only further popularized this kind of problem; innumerable schools have included a World Trade Center problem as part of the curriculum.

While the 'Learning-by-Making' and 'Memorial' problem both address the potential shortcomings of the classic kit-of-parts exercise, they both fail at providing a fine-grain framework for learning the basic principles of design. In the materials-oriented foundation problem, the student is encouraged to think about materials to create 'effects' and logics of assembly, but the broader terms of composition and syntactical relations are not considered. In the Memorial problem, the big idea is emphasized resulting in an overemphasis on metaphor and iconography at the expense of the finer grain of design tactics.

Rather than reject the kit-of-parts problem in favor of the alternatives I have outlined, I would argue that the original intentions of the kit-of-parts problem still provide a useful platform for establishing pedagogy for beginning architecture students. By establishing a set of rules and a limited set of architectural elements, students are best able to explore the expressive boundaries of the discipline. What is missing from the classic kit-of-parts exercise, however is an overlay of content to instigate the architectural process. It is precisely the autonomy of the design exercise, the complete removal of design decisions from both the physical world and a cultural context that may limit theoretical sophistication at later stages of design education and eventually in practice.

Content, however, must be introduced not at the pitch of the big idea; but rather the smaller scale of everyday intention. The comfortable dimensions of café tables and chairs, the cadence of a row of neighboring trees, the way that wood panels can meet a steel column are all particular attributes that can adjust terms of the kit-of-parts exercise to include the corporeal world. In this way, the first architectural problem can be subtly closer to the world that the novice architecture student knows from their own cultural context, a world where need, pleasure, and desire are motives for invention. Architecture, in the end, can be self-reflective and knowing of its poetic history, but only at the service of larger motives. Architecture cannot only be about itself, an epistemology that was possible, and even necessary from the late 1950s until the late 1970s, when the discipline rediscovered its own poetic principles.

Notes

¹ For an excellent, if uncritical, history of the development of the pedagogy that I describe in this paper, see Alexander Caragone, *The Texas Rangers: Notes from an Architectural Underground* (Cambridge, MA: The MIT Press, 1995).

² Wittkower, Rudolf, *Architectural Principles in the Age of Humanism* (New York: W.W. Norton and Company, 1962). First published in 1949

³ *Ibid.*, pg. 72.

⁴ Rowe, Colin, "Mathematics of the Ideal Villa," *Mathematics of the Ideal Villa and Other Essays* (Cambridge, MA: The MIT Press, 1976). First published in *Architectural Review*, 1947.

⁵ Rowe's later essay on La Tourette, published in the *Architectural Review* in 1961 (also in *Mathematics of the Ideal Villa and Other Essays*), can be interpreted as a validation of Rowe's original reading of Corbusier's work.

⁶ Arnheim, Rudolf, *Art and Visual Perception: A Psychology of the Creative Eye* (Berkeley, CA: The University of California Press, 1974). First published in 1954.

⁷ Rowe, Colin and Robert Slutzky, "Transparency: Literal and Phenomenal," *Mathematics of the Ideal Villa and Other Essays* (Cambridge, MA: The MIT Press, 1976, pp. 159-183). Written 1955-56, first published in *Perspecta*, 1963.

⁸ The influence of Mies is perhaps different in this case than his direct influence on pedagogy at the Illinois Institute of Technology.

⁹ Eisenman, Peter, "From Object to Relationship I," *Casabella* 344 (January 1970) and "From Object to Relationship II," *Perspecta* 13/14 (1971).