Rediscovering Froebel: Discovering Architecture's DNA

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The active and creative, living and life producing being of each person, reveals itself in the creative instinct of the child. All human education is bound up in the quiet and conscientious nurture of this instinct of activity; and in the ability of the child, true to this instinct, to be active."

Friedrich Froebel: The Sonntagsblatt (1838-1840)

Figure 1: Friedrich Froebel

Friedrich Wilhelm August Froebel (1782-1852) was a German educational theorist who laid the foundation for modern education based upon the unique attributes and capabilities of children. Froebel, who studied Crystallography and Forestry before becoming involved in educational reform, believed in the basic uniformity and unity of nature's laws (MacCormac, 2005:124). Froebel's Kindergarten, as a place of natural and social encounter provided the location, both in metaphor and reality, for observation and interaction with nature. Froebel's thinking preceded others like Karl Blossfeldt, whose natural taxonomy Urformen der Kunst (Art Forms in Nature) published in 1928 advocated that all art forms could be found it nature. By the turn of the twentieth century, as noted by Norman Brosterman, in his Inventing Kindergarten, (1997) Froebel's ideas and methods had significant impact on abstract art including Cubism, Futurism, Suprematism, Neo-Plasticism, and The Bauhaus, The International Style, and the Organic Architecture of Frank Lloyd Wright. Wright in particular would argue that the Froebel method he had received as part of his Kindergarten training "proved an unforeseen asset.... a properly proportioned unit system all to scale.... like a tapestry, a consistent fabric woven of interdependent, related units, however various." (MacCormac, 2005:124).

Since 2008, I have developed a design process using Froebel Gift Sets three through six that encourages students to discover and interpret the underlying patterns and structures that comprise their world as a preamble to design. Recalling the nature of DNA, the molecule that carries the genetic instructions used in the growth, development, functioning, and reproduction of all known living organisms, the abstract compositional outcomes of the Froebel-based exercises reveal aspects of the essential nature of things. I have used this process with student populations ranging from secondary STEM populations to architecture undergraduate and graduate students.

The Gifts and Occupations

As part of his kindergarten model, Froebel developed his "System of Gifts and Occupations" as a means to enhance a child's interaction and interpretation of the natural world. The first nine gifts were situated by Froebel's successors to foster a child's design skills while Gift Sets ten through twenty were aimed at developing a child's craft occupations, although, as noted by Norman Brosterman (Brosterman, 1997:36) their attributes could be reversed with equal efficacy. W. N. Hailmann, cited by Brosterman as an important voice in the American kindergarten, advanced this dialectic when he stated:

> *The gifts give the child a new cosmos, the occupation fixes the impressions made by the gift. The gift invites only arranging activities, the occupation invites also controlling, modifying, transforming, creating activities. The gift leads to discovery; the occupation, to invention. The gift gives insight; the occupation, power."*

Gift Sets three through six are wood blocks of varying size and proportion based upon a one-inch module. Gift Set Three is comprised of eight one inch cubes, forming a two-inch cube and Gift Set Four is formed by eight one half inch by one inch by two inch blocks again forming a two-inch cube. Gift Set Five is again based upon the one-inch cube but more complex, composed of twenty-seven one inch cubes, three of which are bisected diagonally, and three which are quadrisected diagonally forming a three-inch cube. Thus, the Fifth Gift Set is a variation of the third. Gift Set Six relates to the fourth as it contains thirty-six blocks, eighteen bricks proportioned as per Gift Set Four, twelve half cubes formed by bisecting the typical brick horizontally, and the remaining six column bricks are made by slicing a typical brick vertically. Children used these blocks to explore form in three types: Life, Beauty, and Knowledge. Forms of Life represented things which are seen in the daily experience of the child. Forms of Beauty are forms of the imagination with an emphasis on symmetry. Forms of Knowledge are mathematical in concept and expression. Many of these exercises would be conducted in conjunction with the use of a gridded mat or "network table".

Figure 2: Froebel Gift Sets 3-6

In my approach to deploying the gift sets in the design studio, I have transformed their use and meaning. New Forms of Life, Knowledge, and Beauty are explored through a series of timed exercises that explore form in response to a series of verbal prompts. In lieu of Forms of Life,

students develop Forms of Emotion derived from the landscape of interior human experience. The new Forms of Life are explored through emotive analogs (e.g., fear, serenity, angst, etc.). Taking the place of Forms of Knowledge, Forms of Architectural Order (e.g., linear, clustered, radial, etc..) advance exploration of traditional systems of architectural order. Forms of Beauty become Forms of Nature as seen in the patterns derived from exercises that explore formal possibilities that emerge through the lens of black and white nature photography.

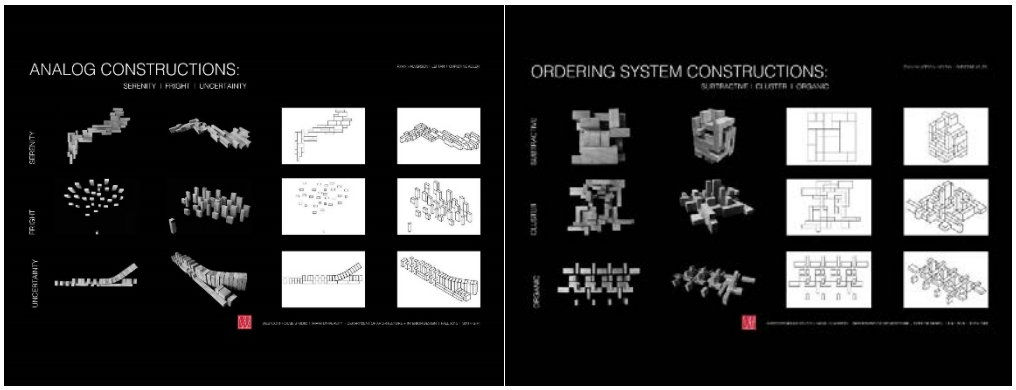


Figure 3: *Forms of Emotion* (Analog) and *Forms of Order* Exercises

On Aesthetic Experience

My exploration of the Froebel gift sets and transformation of the Froebel methodology as it related to the three ideal form types arose from a desire to enhance the experiential quality of the design process and foster haptic experiences that inform the intellectual dimensions of design speculation. It explores the nature of aesthetic experience suggested by John Dewey in Art as Experience (Dewey,1934:220) as:

> *"a product, one might almost say bi-product, of continuous and cumulative interaction of an organic self with the world."*

Here Dewey redirects the emphasis on the object's physical manifestations to the development of experiences essential to the artistic process. In this instance, the object retains its primary role through unifying the dialectical processes of the experience of daily life. Dewey argues further that art begins with a felicitous immersion in activity that, when conducted with care, leads to artistic engagement, aesthetic experience, and an intensified mode of living. For Dewey, each aesthetic experience has a specific, unique quality with its own beginning and end, or "plot" and this singular quality permeates the experience. While intellectual, the experience is also emotional. Aesthetic experience in Dewey's terms, related to other non-aesthetic experiences, has a structure that is sensed and recognized, that leads to an emotional completeness or unity with emotion as the primary force structuring the experience. The outcome, for Dewey, is the expressive object, related to the process and the experien tial vision that produced it.

The Natural History of Form

Dewey argues that artistic form is deeply rooted in the world. It expresses the interaction between the observer and the environment providing the emotive elements of aesthetic experience such as tension, resistance, etc. which lead to form. Dewey argues that these elements of interaction that determine formal identity are a type of natural rhythm.

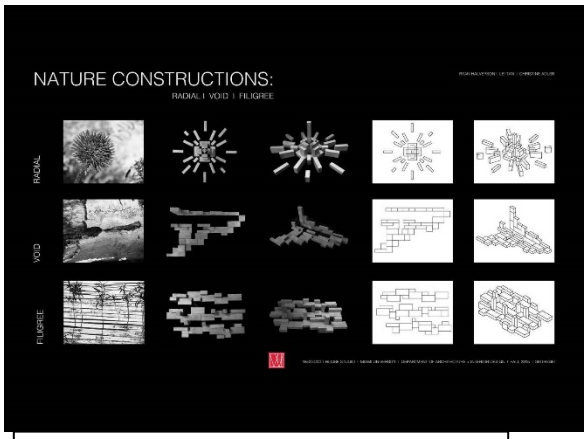


Figure 4: Forms of Nature

Deployed aesthetically, Dewey argues that these rhythms or pattern of relations constitute artistic form and argues that rhythm discovered in nature underpins all poetry, painting, architecture, and music. Analogous to Dewey's conception of natural rhythm, the underlying patterns of the natural world can be advanced as a form of design DNA. If one accepts that design involves the revealing or decoding of patterns that express the interaction between the observer and the environment, this construct links the work of art, through direct experience, to the process of its making. For Dewey, it is essential that works of art communicate the nature of experience in such a way that reveals its meaning through the the expression of the individuality of parts and their relationship to the whole.

The initial design process begins with the students building Froebel Gift Sets 3 through 6 in terms of their contents and container from a raw section of maple or other native species. The container construction explores box joinery and celebrates various movement and operational strategies for its opening and closure. The gift set contents are fabricated to within one thousandth of one-inch degree of tolerance.

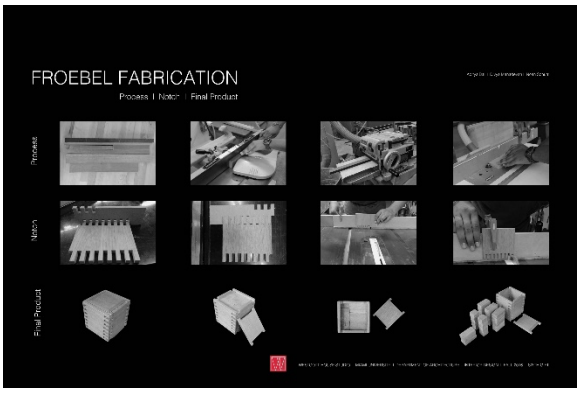


Figure 5: Froebel Fabrication

The students then use the gift sets to explore systems of order, both emotive and analogic, as well as traditional architectural ordering systems through a series of timed exercises which are photographed and drawn to explore their experiential content. Additionally, students explore a tectonic theme discovered in nature which they capture in black and white photography and express as a Froebel composition and explored further through experiential drawing.

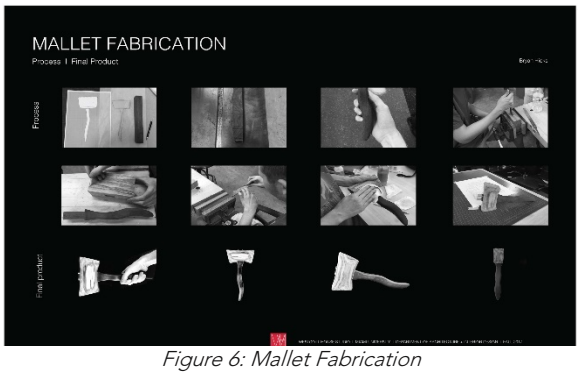


Figure 6: Mallet Fabrication

From this point in the process, the exercises branch out into issued-based scenarios related to the larger design problem. If it is a site design or master plan, the students may explore their Froebel compositions as a paper weaving to explore site part-whole affinity. If it is an architectural problem, I ask the students to fabricate their own tools (Mallet + Hand plane) to construct a joint (Column-Beam + Column-Base) derived from their encounter with nature through their photography and Froebel exercises.

Figure 7: Hand plane Fabrication

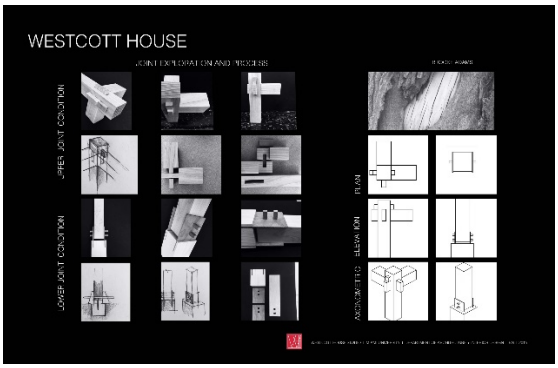
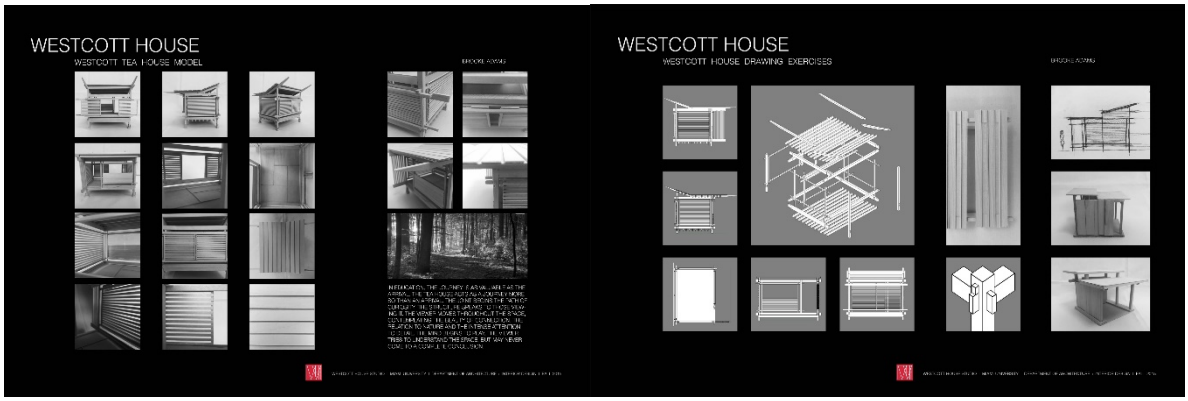


Figure 8: Column + Beam, Column + Base Exercise

Like DNA, the column-beam and column-base conditions act as an architectural "Rosetta Stone", informing the architecture from tectonics to morphology. Small scale design interventions serve as the investigative platform to deploy the tectonic discoveries made in column-beam + column-base exercises. As a case in point, the Tea House design proposals for the Westcott Center for Architecture and Design, derived from a column-beam condition inspired by both a natural event in the surface structure of a tree and Japanese joinery, establish a slipped, intersecting grammar of notched light-weight structural framing members that support the floor and roof systems. The building envelope becomes a variation of this system, with horizontal screen members notched and pinned to the vertical structural frame. The tectonic system advanced by the column-beam condition enhances the light-weight, filigreed character of the main volume in accord with the sources that inspired it.



Figures 9+10: Westcott Tea House Model and Tectonic Studies

Conclusion

To date, I have explored this process at additional scales ranging from the site, the detail, the object, the building, the building interior and its elements, depending on the experience and year level of the student cohort. The Froebel-based design process foregrounded here envisages time as a generative dimension of design inquiry. Through the exercises, student design narratives emerge out of the diversity of their past experiences and memories that are

suspended and intertwined in a visceral and tactile present. Captivated in the simultaneity of their individual and collective responses to the open nature of the design prompts, students discover the patterns or design DNA that will inform their future design speculation, decision making, and project outcomes.

References

1. Blossfeldt, K., 1928, Urformen der Kunst, Verlag Ernst Wasmuth A.G., Berlin.

2. Brosterman, N., 1997, Inventing Kindergarten, Harry N. Abrams, New York.

3. Dewey, J., Art as Experience, Minton, Balch & Company, New York.

4. MacCormac, R., 2005, 'Form and Philosophy: Froebel's Kindergarten Training and Wright's Early Work',

5. In R. McCarter (ed.), On and By Frank Lloyd Wright: A Primer of Architectural Principles, Phaidon Press Limited, London.

Illustration References

Figure 1: Courtesy of Froebel USA, https://froebelusa.com/froebel-philosophy

Figure 2: Courtesy of Froebel USA:

Gift Set 3: https://froebelusa.com/gifts/intro-to-the-gifts/gift-3

Gift Set 4: https://froebelusa.com/gifts/intro-to-the-gifts/gift-4

Gift Set 5: https://froebelusa.com/gifts/intro-to-the-gifts/gift-5

Gift Set 6: https://froebelusa.com/gifts/intro-to-the-gifts/gift-6

Figure 3: The Miami University Westcott Design-Build Studio

Figure 3: ibid.

Figure 4: ibid.

Figure 5: ibid.

Figure 6: ibid.

Figure 7: ibid.

Figure 8: ibid.

Figure 9: ibid.

Figure 10: ibid.