

Production and Reproduction; Architecture and Music

David Foxe

“The task of architectural education is somewhat similar to preparing for a career in musical composition for one who does not play a musical instrument....”

—N. Michael McKinnell, “Notes from the Profession,” *Thresholds* 12¹

Architecture and music share a perilous heritage of each being compared to the other, with varying degrees of literalism. Architects supposedly orchestrate tectonics, while musicians show structure, line, and space. As a student of both architectural design and music composition, I am often confronted with reevaluating the extent to which they share similarities, so I may remain focused artistically and because their combinations of creativity and technicality invite the comparison. I believe it is dangerous to delineate equivalencies between art forms, to say that a piece of music is *about* a piece of art or architecture. Similarly, Goethe’s idea relating architecture to “frozen music” seems to do a disservice to both disciplines; taken literally, architecture can often be quite flowing and dynamic, while music doesn’t always feel thawed through. Analyses such as those in *Pamphlet Architecture* 16 that search for *translations* between architecture and music are fascinating but ultimately as unrewarding as transliterated poetry that lacks an original synthesis of syntax, meter, and connotation.²

This quest for equivalency or translation between architecture and music even populates student works, particularly theses. For example, Chih-Jen Yeh’s MIT M.Arch. Thesis, printed in *Thresholds* 12, states that “architecture and music share the same vocabularies: rhythm, proportion, harmony, repetition, contrast, etc.”³ Searching for such “parallels” between architecture and music shows that it is the descriptive, semantic language that is shared rather than any actual content.

Instead of analyzing the final product or the disciplines in the abstract, it is far more meaningful to discuss the creative and educational processes involved in the reproduction and production of music composition and architectural design. Both help create documents to instruct in the production of a reproducible entity (scores, construction documents) rather than create the actual entity. Furthermore, the actual music or architecture will come into being by a further process of reproduction, rarely with more than a supervising role by the composer or architect. In my own experience, each can be modeled as a *design* process, where one places designed elements in a context of time (music) or space (architecture).

It is not a novel notion for architectural education to focus on design (rather than on exclusively technical skills), but musical education is rarely treated as a design process. This descriptive discrepancy may at first appear to be one of semiotics, but it gives a glimpse of how the education processes of architecture and music have different adaptations of production and reproduction.

Throughout history, both architecture and music have occurred without its creators being formally schooled, and the disciplines were once taught primarily through individual tutoring and apprenticeship. The foundation of studying with an established master is to reproduce the masterworks and develop a facility in that manner. Change and development thus occur either through gradual development or punctuated moments of genius. Even Mozart and Bach, however prodigious their talents, had elder family members who facilitated an environment rife with the musical language of their time. These incredibly original creators frequently took up active study and transcription of their predecessors' masterworks, painstakingly reproducing them for new instrumentations or settings so that they might internalize some of the musical devices.

Just as many musical geniuses have learned primarily through self-directed study, Charles Correa is particularly insightful in asserting that "we do not know if architecture can be taught, but we know it can be learned."⁴ He extends this by detailing the educational relationship of the student to a teacher as "guru," for whose wisdom

the student has an unquestioning trust.⁵ Correa applies this guru model both in formal learning situations, in which the student and teacher meet in person, and to Bach, who learned through self-study. Architecture was treated as a building trade one learned through apprenticeship in professional practice and experience. Prior to MIT founding the first school of architecture in the United States (1865), American-born architects who did not study abroad were necessarily self-taught; Thomas Jefferson is a prime example. As architectural education was brought into the formal academic realm, combined with its apprenticeship heritage, Correa describes how the educational environment (from the Beaux-Arts to the present) is periodically inhabited by gurulike instructors.

Because universities and conservatories have codified curricula and largely institutionalized the education process, the disciplines of architecture and music have changed drastically. In music, select examples from the Renaissance polyphony of Palestrina to the classical-era forms of Haydn and Mozart became a sequence of compositional exercises. Students often learn through individually created but highly structured assignments, taught in groups by a professor/composer. The chorales of Bach and the minuets of Mozart are among those studied and emulated for their structure and content. Building on the tradition of Rameau's treatises on theory and harmony, later textbooks for harmony and counterpoint presented a highly clarified, systematic approach to analyzation. The works to be analyzed, however, were not created in this manner; Mozart wasn't following a textbook but rather the accepted conventions of his time. Each student in such classical models creates his own solution, subject to myriad rules, and gradually develops fluency of creation.

Just as conservatory education codified the reproduction of classical harmony, the foundation of a Beaux-Arts education in architecture was that of faithful reproduction, both of the human form and of principled classicism. Like many universities, MIT houses archived collections of student work from 100-plus years ago, including the visually stunning perspective renderings of existing and proposed classical and neoclassical buildings. Even the prefix *neo-*implies the built-in heritage ascribed to such new

adaptations of classical languages. Whether relating to works of Alberti, Wren, or Calatrava, the classical models of proportion and the study of human form are a leitmotif of architectural study. Such education returns each student to a reevaluation of first principles and design strategies disembodied from specific applications, reproducing the basic in order to step beyond and hopefully produce a supposed original.

As a contrasting example, the first experiences with architectural design in MIT's undergraduate studio program emphatically emphasize production over reproduction. A variety of historical precedents, structural languages, and context tidbits are presented, but "first principles" of structure and organization are worked into a more experiment-oriented, model-focused introductory studio. With guidance and wide-ranging examples from Katsura to LeCorbusier to Wright to MDRDV, students "produce" column grids and manage load-bearing, sculptural concrete forms with relation to light wood construction. Just as it would be foolish to assess Beaux-Arts student works from MIT in the 1890s as completely original products, studio works from the 1990s are linked inextricably to the heritage of modernism and organic design that are presented as frameworks for their creative process. Are the best results of both educational processes highly creative? Absolutely, but Mies may be right: Architecture is not reinvented every day.

Meanwhile, music pedagogy at MIT and many other institutions with highly respected composition faculty has retained several strong elements of classical reproduction in contemporary education. Even after a century in which many of the rules of classical harmony have been routinely shattered, the traditional forms and models for harmony are still taught precisely so that students know how to break them. Whereas architecture studios now begin with essentially twentieth-century principles, music from the same period is reserved for advanced study. Experimental trends in extended harmony, aleatoric and improvisatory techniques, and minimalist repetition that are commonplace in contemporary composition are treated as a realm only reached after mastery of the accepted conventions of the nineteenth century. Even professors like John Harbison, whose Pulitzer Prize-winning composition work has its own rigorous and highly personal style, teach tonal

harmony within historical rules and models so that students can learn techniques to apply to their own style.

These generalized trends in music and architecture are certainly not without exception. Dissent about education has a long history, often centered around young emerging radicals protesting the banality of work emerging from institutions. Beginning with Wright's oft-exaggerated legend about abandoning his studies, architects in the heyday of twentieth-century architecture espoused ideas intended to shatter traditional academia and its self-reproduction. Their alternative: original forms of (often guru-centered) education for new types of production. These came full circle as Bauhaus leaders like Mies and Gropius became heads of American architecture schools, and Taliesin recently became a nationally accredited program.

Similar cycles have occurred in twentieth-century music as emerging musical languages lost their ability to incite riots (such as Stravinsky's *Rite of Spring* in 1913) and became staples of most advanced composition studies. However, the underlying motivations for dissent differ. French Impressionist composer Claude Debussy criticized the conservatory education process for its uniformity. In the first issue of the journal *Musica* in 1902, he writes:

The best thing one could wish for French music would be to see the study of harmony abolished as it is practiced in the conservatories. It is the most ridiculous way of arranging notes. Furthermore, it has the severe disadvantage of standardizing composition to such a degree that every composer, except for a few, harmonizes in the same way. We can be sure the old Bach, the essence of all music, scorned harmonic formulae.⁶

The example of Bach is crucial because his concise, aphoristic chorales and keyboard inventions are primary formal examples imitated during introductory composition courses, yet the complexity and surprising turns in many Bach examples defy explanation in an introductory academic setting. Whether in Bach and Britten or in Aalto and Moneo, the most brilliant solutions are remarkably often those that create a clear and focused logic for structure and content, and then are bold enough to break that logic for a specific requirement or moment of uniqueness. Debussy's assertion is thus critical, but not in the

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sense of a creator of the "modern" objecting to the "historic" tradition: Studying past examples and writing music that uses the logic of a precedent as a point of departure is highly valuable. About the same time he wrote the *Musica*, Debussy composed his *Pour le Piano* suite. It makes extensive allusions to Baroque forms and techniques, but with new harmonic and phrasing twists and turns. The practice Debussy warns against is to narrowly use examples from the past as a pattern-book of strategies to be applied uniformly or with a rigid grammar.

Half a century later, architect Alfred Caldwell was a frequent voice of dissent in education. He criticized academic initiatives that focused on "research" in architecture prior to mastery of design fundamentals. He described how the Latin origin of research means "to go round again. Now if you don't know anything about these things, how can you do research in it? You haven't gone round it once?"⁷ Caldwell recognized the need for reproduction and practice in student work before actual productive research or the creation of a viable new entity can occur. Even though he did not have a thoroughly formal university education, his landscape architecture work led Mies to ask him to teach at IIT. He later taught at Virginia Polytechnic and USC with a highly individual style that often antagonized administrators but drew great respect from many students who admired such an iconic individuality in education. By reverting to the "guru" model in his teaching, he reconnects back to the era of individual masters from which architecture and music both emerged.

Amid such dissent, there is some common ground between architecture and music occurs with respect to their experiential aspects. To be actually produced, designs depend on their reproduction in real space, and compositions need to be played. Whereas architecture can be experienced and revisited as an object without

necessarily being inhabited (a sad proposition), music requires people as performers for mere existence, to reproduce it live. The exception is that one can instead listen to a recording, adding yet another layer of reproduction. In truth, however, this occurs in architecture: One experiences examples of the built environment most often through reproduced drawings and photographs rather than physical visits. The architectural "Grand Tour" is often mediated by digital media or someone else's predetermined view, and the resulting comprehension of space is just as incomplete as a recording compared to a live performance.

In the design processes of music composition and architecture, the key is to develop a sense for visualizing and feeling the characteristics of the final product through a series of reproductive, predictive exercises. In other words, an aspect of the education process is learning to predict the experiential nature of the project in its fullness through the management of reproductive simulation. Dissecting a preexisting design analytically and documenting existing built conditions are among the ways to reproduce an original in order to learn how to translate the drawings and documentation into real space. Likewise, perspectives and models enter into educational situations to reproduce the orthogonal projections and give a sense for the proposed design. In music, the use of computer-simulated sound can be just as magical or misleading as visual simulation. Especially with ensemble works that cannot be transcribed for piano or another single instrument, analysis and mastery of each of the parts is necessarily matched by a mental conception of the whole. One will not always have a batch of fresh concrete or a string orchestra to try out new materials and ideas, but through experiential learning of how concrete or strings behave, the product can be a more faithful reproduction of the ideal. ■■