

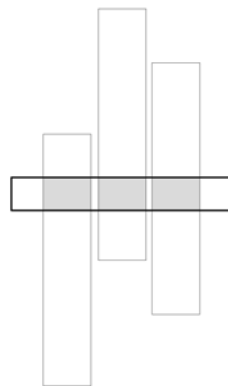
Designing the Literal from the Metaphor:

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A recent competition asked for a house of multiple dimensions in which the basis for the design lay in the relatively new field of string theory. How one interpreted such a theory was left open, it was merely to act as a catalyst or inspiration. So the question arises of how literally you can design from a metaphor. To begin we need a quick introduction of the background to string theory. Think of a guitar string that has been tuned by stretching the string under tension across the guitar. Depending on how the string is plucked and how much tension is in the string, different musical notes will be created by the string. These musical notes could be said to be excitation modes of that guitar string under tension. In a similar manner, in string theory, the elementary particles we observe in particle accelerators could be thought of as the "musical notes" or excitation modes of elementary strings. In string theory, as in guitar playing, the string must be stretched under tension in order to become excited. However, the strings in string theory are floating in spacetime, they aren't tied down to a guitar. Nonetheless, they have tension. The string tension in string theory is denoted by the quantity $1/(2\pi\alpha')$, where α' is pronounced "alpha prime" and is equal to the square of the string length scale. If string theory is to be a theory of quantum gravity, then the average size of a string should be somewhere near the length scale of quantum gravity, called the Planck length, which is about 10^{-33} centimeters, or about a millionth of a billionth of a billionth of a billionth of a centimeter. Unfortunately, this means that strings are way too small to see by current or expected particle physics technology (or financing!!) and so string theorists must devise more clever methods to test the theory than just looking for little strings in particle experiments. String theories are classified according to whether or not the strings are required to be closed loops, and whether or not the particle spectrum includes fermions. In order to include fermions in string theory, there must be a special kind of symmetry called supersymmetry, which means for every boson

(particle that transmits a force) there is a corresponding fermion (particle that makes up matter). So supersymmetry relates the particles that transmit forces to the particles that make up matter. Supersymmetric partners to currently known particles have not been observed in particle experiments, but theorists believe this is because supersymmetric particles are too massive to be detected at current accelerators. Particle accelerators could be on the verge of finding evidence for high energy supersymmetry in the next decade. Evidence for supersymmetry at high energy would be compelling evidence that string theory was a good mathematical model for Nature at the smallest distance scales.¹

To literally translate string theory into design is a delicate issue. To try and match idea to design piece by piece is both unimaginative and impossible. For one there are far too many aspects to string theory than you could possibly design and more importantly design of the house dictates certain functions that do not have a relation to theory. Instead we proposed to distil the ideas of string theory down to a few main points and apply them to our design. In this case we looked at the idea of how multiple dimensions would apply to the use of functions in the house. String theory says that we have 11 dimensions of which we experience 3. From this we extrapolated the idea of creating a house with 11 distinct functions in which three were only in use at one time whilst the others



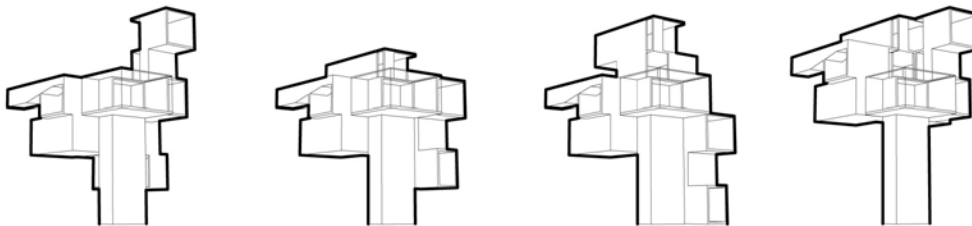
where in a state of influence around it.

At any given time any

number of combinations of function could be in use. Breaking the building down

¹ Greene, Brian "The Elegant Universe: Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory" Vintage, 2000, pp 104-156

into public living space, private living space, washroom, shower room, dining room, kitchen, bedroom, shag pad, lap pool, grassed roof and winter garden, each function was given its own distinct room according to approximate size needed. Next each was assembled in a manner to create functions which related to each other, or could relate to each other, ie the bedroom would relate to the shower room on one side of the lap pool on the other, the lap pool could be associated with the public living area; the dining room could empty on the grassed room. Various functions were grouped and stacked together, in one of three pods, which then were suspended off a central core. This core, which leads down the length of the building and would be accessible from street level, would tower up and out over the rooftops of the Shinjuku area of Tokyo, known for its vibrant streets and signage. Each pod would then be attached to the core on hydraulic lifts allowing each building to move up and down aligning new programs with each other, turning the building into a source of tension and flux. Again this idea was to mimic that of string theory, without having to literally interpret it as such.



Other such cases of pulling design from a metaphor can be found in such buildings as the Maison Bordeaux by Rem Koolhaas. The owner who had been in a car accident was confined to a wheelchair; Koolhaas took this and created



the metaphor of the 'the machine as its heart'²

² Riley, Terence "The Un-Private House" New York: Henry H Abrams, 1999, p42

where he built a large platform in the centre of the building allowing the owner access to all levels of the house. This was the most straightforward way of addressing the issue at hand. Working not from a position where the metaphor of the machine dictated all design it merely created the initial idea which all others could revolve. The central lift provided a catalyst from which all other design ideas could relate too. In this respect the idea of metaphor was merely a means to an end, not the purpose of the design at all. Koolhaas has a habit of this in his buildings, at once very functional yet also containing certain moments of inspiration, but only inasmuch as they contribute to programmatic elements.³ The IIT student centre in Chicago uses the metaphor of a building pressed under



the weight of the train running overhead, yet this is merely one aspect of the design, there is no 'dogma' attached to this building. Rather ideas are dispensed on a piece by piece basis held together through the function of the building as opposed to a central 'metaphor' which is the guiding design.⁴

One of the dangers in using metaphor as a strict guideline to design is the constant need to provide rational to the argument. To say you are basing the design on, for example, string theory means that you must constantly give justification to decisions made. To merely do something for the sake of doing something isn't allowed. Yet when you can't tie back ideas into the design it somehow weakens the arguments put forth for why decisions are made. Steven

³ Ibid, pp43-44

⁴ Rem Koolhaas McCormick Tribune Campus Center

<http://www.arcspace.com/architects/koolhaas/McCormick-Tribune/>

Holl is an example where as science plays a big role in design. When keeping with his profound belief in phenomenology as design he can succeed as it isn't a case of having to be literally interpreted into design. One can say that light and experience can be a general guideline that allows interesting spaces to be created. In his chapel of St. Ignatius light is bottled up within the building, pouring in through lightwells and windows in such a manner so as to give more experience than merely being an open space



would.⁵

However when he attempts the Stretto house in Texas, these ideas get lost behind the concept of music that he uses as a metaphor for the design. Attempting to create shapes that mimic the overlapping stretto; 'the house projects the character of the site through a series of concrete "spatial dams" with metal framed "aqueous space" flowing through'.⁶



It is this very approach as to why the

⁵ Chapel of St. Ignatius
www.stevenholl.com

⁶ Stretto House
www.stevenholl.com

house fails. To design according to phenomenology means leaving the experience up to the individual; to design based on metaphor implies that the occupant is also aware of that metaphor and thus can appreciate it also. The danger with this lies when the occupant doesn't know the metaphor behind such a work and this is usually the case, meaning the metaphor then becomes irrelevant.

Metaphor has lost its meaning in architecture, once so prevalent amongst designers as a means of explaining away design decisions, it now languishes in the background. As a means of inspiration it can be a wonderful thing and serve as a catalyst for central aspects of design. In the case of the house for multiple dimensions it was used as a means to format the program of the house in a manner that created a unique design specific to the needs of the competition; however the design was by no means limited to the understanding of the concepts of string theory. In this manner the design can transcend several levels, depending on how one may wish to perceive it. On one level an understanding of string theory can allow for a deeper understanding of the design and the reasoning behind why the building has been arranged in such a manner. To approach it purely on a programmatic level would forgo the need to understand the concepts of string theory and instead appreciate how the various functions relate to one another. Or one could merely appreciate the fact that it moves and the experience that such an event would afford. To attach the level of intellectual elitism that comes with a design based purely on metaphor is to neglect the true purpose of the building, being the experience the subject has with it, and ultimately means an architecture that has lost its relevance.