

Architects Are From Plato

By Erik Anders Nelson, P.E., S.E.

What is good architecture? Why does one building appeal more than another? Is it more orderly or more efficient? Is ornament justified as an art, or does the aesthetic need to derive from a function? What do our greatest western thinkers, Plato and Aristotle, have to say? It is in their work where you will find the great evolutionary divide in comprehending and approaching art and architecture. Engineers evolved from Aristotle and architects from Plato.

First we can define good architecture as that which is universally beautiful. This loaded definition has preoccupied philosophers and artists from the beginning of time. If we can find something that is universal, it becomes objective (as opposed to subjective or opinion) and a sort of "truth". Something that is objectively beautiful is a compelling idea even if it is not possible. We all seem to like different things but there are things that have stood the test of time and are deemed worthy of greatness. But how is it possible? The search for truth, beauty, and goodness is where we can find answers, the so-called holy trinity of Plato (Figure 1).

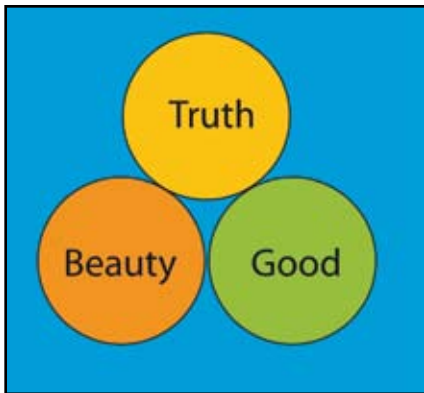


Figure 1: The Trinity of Plato

The ancient Greeks studied natural forms, including the human body, to try to mimic the ultimate creator. They looked to nature to find divine proportions and truth in natural beauty. We find this in the proportion or relationship of the Golden Ratio and the modular proportions of human bodies. This search for beauty was linked to a search for truth. Plato did not distinguish between beauty and truth as clearly as we do today. He found that general forms in nature, what he called "archetypes", are immutable and eternal ideas or patterns that reflect truth and have a divine significance. For Plato, beauty was truth.

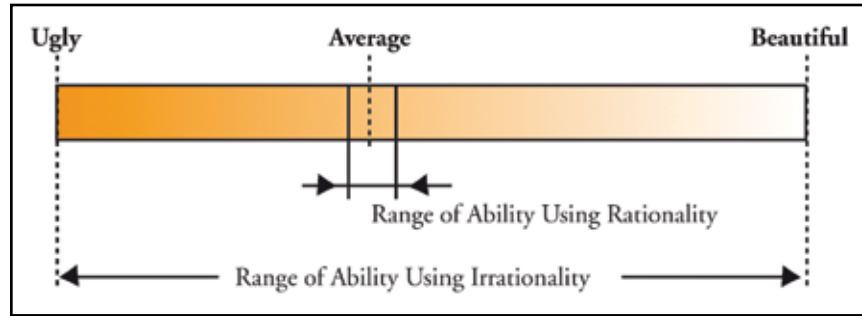


Figure 2: Rationality and Beauty

In two of Plato's works, *Ion* and *Phaedrus*, we find the way to produce good art. "All good poets compose their beautiful poems not by art, but because they are inspired or possessed...there is no invention in him unless he has been inspired and is out of his senses and the mind is no longer with him...these beautiful poems are not human, or the work of man, but divine and the work of god." (Plato, *Ion*, 536) Therefore, the artist must be "finding the nature of their own god in themselves." (Plato, *Phaedrus*, 252). Here, Plato links that which is beautiful with that which is divine and true. His approach to architecture is spiritual and holistic. Plato would find that rationality does not necessarily contribute to beauty; in fact, the artist is better off becoming divinely inspired to create beauty as shown in Figure 2.

Plato's approach is fundamentally irrational, however; having divine inspiration is not a process using reason. In Plato's *Laws* we read "the equal is not equal or the symmetric symmetrical, because somebody thinks or likes something, but they are to be judged of by the standard of truth, and by no other whatever...those who seek for the best song and music ought not to seek for that which is pleasant, but for that which is true." (Plato, *Laws Book II*, 668) But what is truth? We (engineers) find truth in mathematics and our understanding of materials to create forms. These forms follow mechanical laws and are able to carry loads from top to bottom. Engineers, we will see, evolved from Aristotle.

Aristotle had a more structured and scientific approach to creating good architecture. He used observation to reduce and classify nature. To Aristotle these theories of proportion have no divine or formal significance. A building can be designed beautifully by the application of mathematics, a secular (albeit spiritual

for some) language. Gothic architecture stemmed from this approach, where rules of proportion according to structural requirements governed the design of the flying buttress and the ribbed vault. This method continued into the time of Galileo, who first attempted to answer the question of a cantilever, "Where will it break?" At that moment, the science of material mechanics was born, a second beginning of the scientific method heralded by Aristotle. This is when architecture became a science, and when science governed the form.

Plato believed proportions can be inherently beautiful, simply because they are found in nature and life and are expressions of "truth". The desire to force architectural forms to perfect circles and squares are clearly expressed in Renaissance Architecture. Also, the mystique of numbers such as pi, the Fibonacci sequence, or the Golden Ratio is intriguing to Plato and architects because they may be the basis of beauty. We remember it was the mathematician Leonardo Fibonacci who found that the additive number sequence 0,1,1,2,3,5,8,13... describes spiral growth patterns of plants and animals. This number series also generates a proportion called the Golden Ratio or Rectangle. So should all windows of a particular building be 8:13 because we find this ratio in nature? The answer is yes for some. In fact, I had to change the exterior bracing on several high rise residential towers in Beijing to follow proportions of Fibonacci. The designers wanted rise to run ratios of vertical bracing to follow Fibonacci, such as 1:2, 2:3, or 3:5. For example, a brace with a ratio for 3:4 had to be changed (Figure 3a and b).

But what does an inanimate object, like a building, have to do with an animate one?

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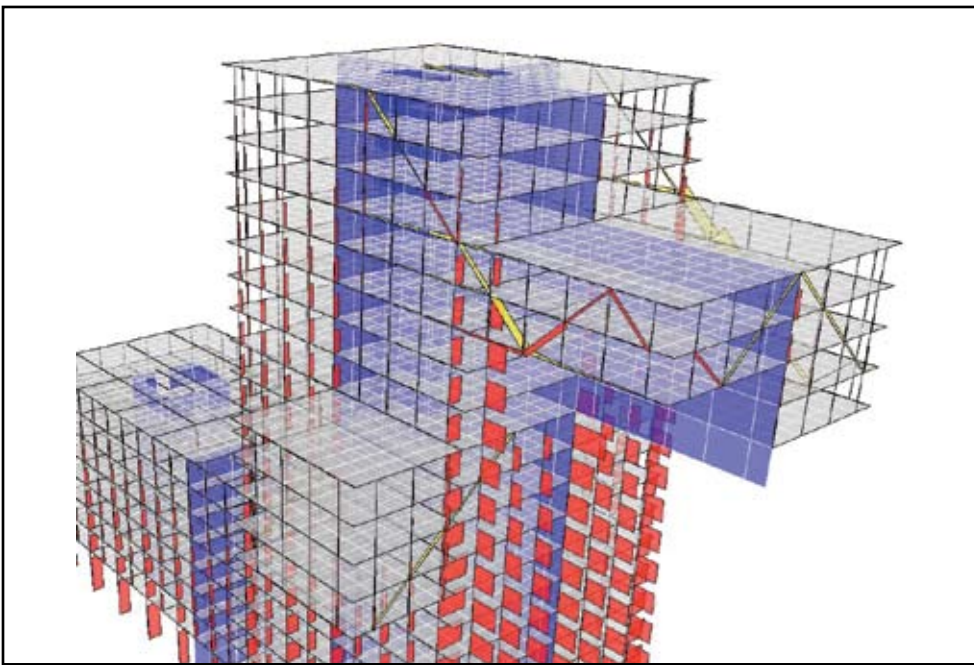


Figure 3a: Fibonacci Bracing

Aristotle, in his work *Parts of Animals*, develops a different approach to the design process. He states that one “starts by forming for himself a definite picture, in the one case

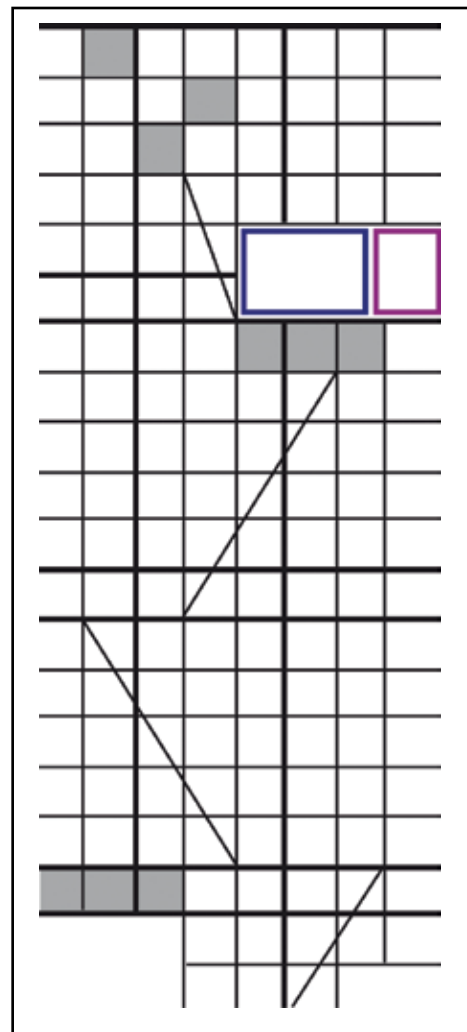


Figure 3b: Fibonacci Bracing

perceptible to the mind, in the other sense of his end – the builder of a house – and this he holds forward as the reason and explanation of each subsequent step he takes.” (Aristotle, *Parts of Animals Book I*, 640) Here, every action of an engineer or architect follows a particular reason to achieve the end goal.

For example in the case of *Figure 4*, Aristotle and engineers would find the answer to be completely subjective. But if pressed, they would ask about snow loads, and if there is snow, would find the triangle roof superior. That is because Aristotle, contrary to Plato, believed architecture to be a rational process; shedding snow from a roof is rational. He argues that the scientific method has a hand in the judgment of art. “The chief forms of beauty are order and symmetry and definiteness, which the mathematical sciences demonstrate in a special degree.” (Aristotle, *Metaphysics Book XIII*, 1078) Aristotle also believes “Every art does its work well – by looking to the intermediate and judging its work by this standard.” (Aristotle, *Nicomachean Ethics Book II*, 1106)

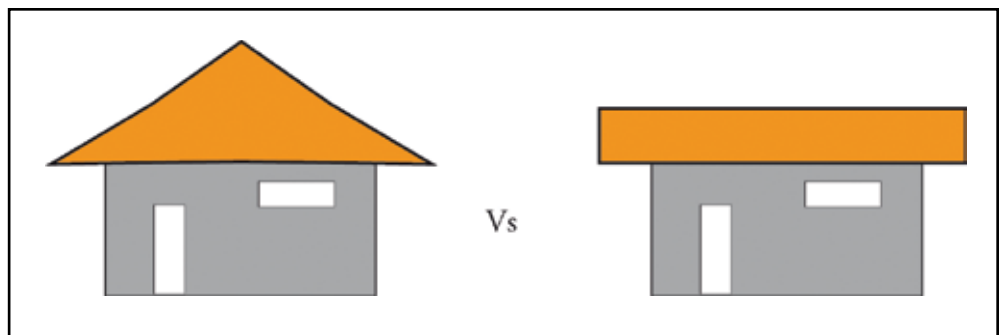


Figure 4: Is there a better choice aesthetically?

To Plato and architects of course, the idea of intermediate or symmetric forms can constrain architecture. Antoni Gaudí and Frank Gehry are neither intermediate nor symmetric. For Antoni Gaudí, the master of fluid and organic forms, the straight line belonged to men and the curved line to God. Whether curved or straight, Plato felt it necessary to find objective beauty and attempted to dispel subjectivism in art. He believed that what is central to an artist is his/her ability to understand the nature of measure (what we today call proportion). The architect, according to Plato, must know the nature of measure and with this knowledge can find a square roof more aesthetically pleasing than a triangular one. “The art of measurement is universal, and has to do with all things.” (Plato, *Statesman*, 285b) Accordingly, there may be a “proper” size for a column or window. Here, Plato argues for the doctrine of objective beauty, which may give the architect the upper hand in making an aesthetic judgment. But how does one earn the advantage of passing artistic judgments of things?

It should be noted that while Gaudí thought the curve or circle was otherworldly, Mies van der Rohe found a curve unnecessary. Mies van der Rohe believed everything had to have a reason, and a curve is not reasonable. For him, subjective decisions were unwarranted and did not contribute to a better building. One could argue that the modern movement of the first half of the 20th century – Le Corbusier, Walter Gropius, Marcel Breuer, Mies van der Rohe – was actually a throwback to Aristotle and Galileo. But “Some Architects are from Aristotle” would be a less catchy title for this article.

The postmodern movement in architecture was a reaction to the logical rigor of early modernists like Mies van der Rohe. It was a movement that tried to give Plato center stage in the built world, when Aristotle and rationalism become overbearing. Postmodernists reverted to classical form because that mode of architecture seemed to have passed the test of time and was deemed “good”. Another more recent movement against Aristotle in architecture is deconstructivism. Architects such as

Frank Gehry view our rational and scientific approach to architecture as an affront against holism and human concerns. Those architects want to deconstruct or displace order and orthogonal form. Unlike Aristotle, they believe architecture can be great without rational form.

The great early modern architect Louis Sullivan, who invented the simple phrase “form follows function”, may have dispelled these questions of objective verse subjective views of beauty in his book *Kindergarten Chats*.

The master: “I am endeavoring to impress upon you the simple truth...of the subjective possibilities of objective things. In short to clarify for you the origin and power of beauty – to let you see, that it is resident in function and form.”

Student: “So is ugliness, isn’t it?”

The master: “To be sure.”

Here Sullivan finds a link between objects and beauty that is not subjective; but, he still admits to the student that a building derived from form following function can still be ugly. However, he does suggest that the form of a building should follow function, at a minimum, to be considered beautiful. Like Plato, Louis Sullivan can not separate beauty from truth.

Again, Aristotle rejects form based on a justification of “inherent beauty” and insists on rational explanations. Aristotle, because of his high regard to the scientific method, would be able to graph truth versus beauty in Cartesian coordinates (an assumption I am making, he did not actually do this). He would assign truth as a different dimension to beauty; literally, truth on a separate axis from beauty. (Plato we remember would disagree, for Plato truth and beauty are linked and cannot be separated.) Aristotle would find architects to exist in the lower right of *Figure 5*. He would find engineers to be closer to truth.

If beauty and truth were valued equally, both architects and engineers would tend to be the same shade of orange. Only the greatest designers of us would be able to transcend this dichotomy and reach lighter spectrum (the upper right of *Figure 5*). But to do this, one must assume this so-called dichotomy between beauty and truth doesn’t exist, and live and design with that in mind. That is the difficulty. It is important to note both of these approaches are honest, albeit different. Whether the truth of beauty is found through laws of mechanics or archetypal forms may be less important. The question is... who will we as designers turn to next for beauty, Plato or Aristotle? Either way, both represent truth and that is good.■

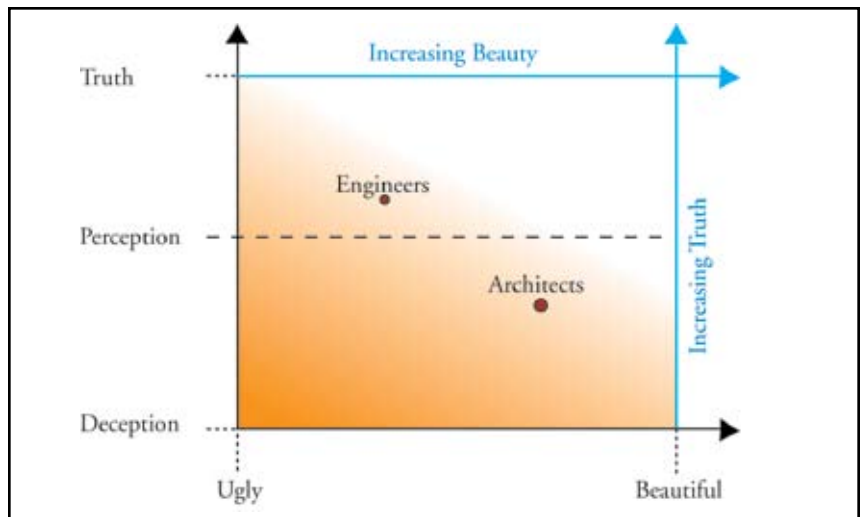


Figure 5: Rationality, Beauty and Truth for Aristotle (not to be taken out of context)

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