

## **Architecture and Evolutionary Psychology**

**Charles Siegel**

Vernacular and traditional buildings have common features that create places people are comfortable with. This is what Christopher Alexander calls “the timeless way of building.” Modernists abandoned these timeless patterns because of their fascination with new technology and their search for novelty, which is why modernist architecture feels uncomfortable.

Evolutionary psychology can help us understand why we like this timeless way of building and why modernist architecture goes against human nature.

We must begin by thinking about attitudes toward building that developed during the period of evolutionary adaptation, when our ancestors were nomadic hunters and gatherers. They only built temporary structures, because they stayed in one place for a time, until they depleted their food sources, and then they moved on to a place where food was more plentiful. They built with materials found on the site, because they did not have domesticated animals to help them haul things, so they took only what they could carry when they moved.

Permanent buildings developed later, beginning about 10,000 years ago, after agriculture allowed fixed settlements. Agriculture and domestication of animals are relatively recent and have not had much effect on human evolution. There have been some evolutionary changes since then, but these changes are relatively minor, and they are not universal because they happened after people separated into different groups. For example, some groups evolved lactose tolerance after they domesticated animals and people who could digest milk had a better chance to survive, but Chinese did not evolve lactose tolerance because they did not domesticate animals that produce milk.

If we are looking for universal principles that underlie vernacular and traditional architecture across cultures, we have to go back to Paleolithic times. Despite the immense difference between what people built then and what people built after they had permanent settlements, we can find a basis in evolutionary psychology for key principles of today's theories of traditional architecture and urbanism.

### ***Scale of Whole to Part***

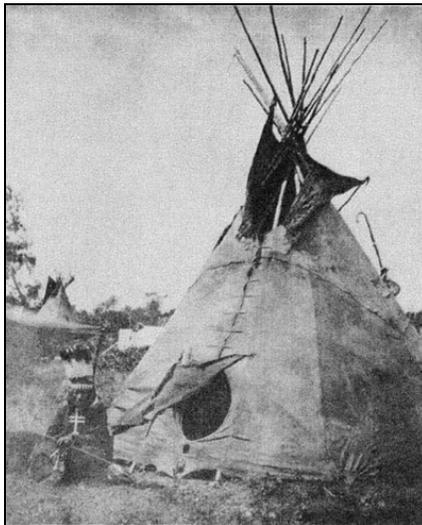
One principle of today's traditional architecture is the proper scale of whole to part. Christopher Alexander and Nikos Salingaros have found that people are comfortable with buildings that have a hierarchy of scales, with a ratio of about three to one.

A large building might be broken up into two wings and a central portion, each one-third the size of the building. These three portions might each be broken up into three bays by pilasters. The bays might have windows that break them up visually into smaller areas.

There is a great deal of latitude involved. The ratio could be anywhere between two and five rather than three. The submasses of the building could be unequal. Sometimes traditional buildings use more than five repeated elements, to create an effect that is imposing rather than comfortable. Nevertheless, there is a hierarchy of scales within the building, and the ratio of whole to part at each level in the hierarchy is somewhere near three-to-one.

We can speculate that this comes from the ratio between the structure and the entranceway in temporary structures, as we can see in the illustration on the following page.

In this nineteenth century photograph of an American Indian teepee, the width of the entrance is somewhat less than one third of the width of the front of the structure. But this structure is made of hides that have been sewn together, and the needle was invented relatively late in our evolutionary history, probably about 50,000 to 75,000 years ago. During most of our evolutionary history, the structure would have been smaller, and the entrance would have remained about the same size, creating a ratio of about three to one.



If the entrance is larger than this, the building does not offer as much protection from the weather. If the entrance is smaller than this, people are likely to knock over the structure when they are getting in and out. Our Paleolithic ancestors probably built structures that were more flimsy than the teepee in the illustration, made of branches and leaves or vines that they found at each place they stopped, so there was a real danger of knocking over the structure.

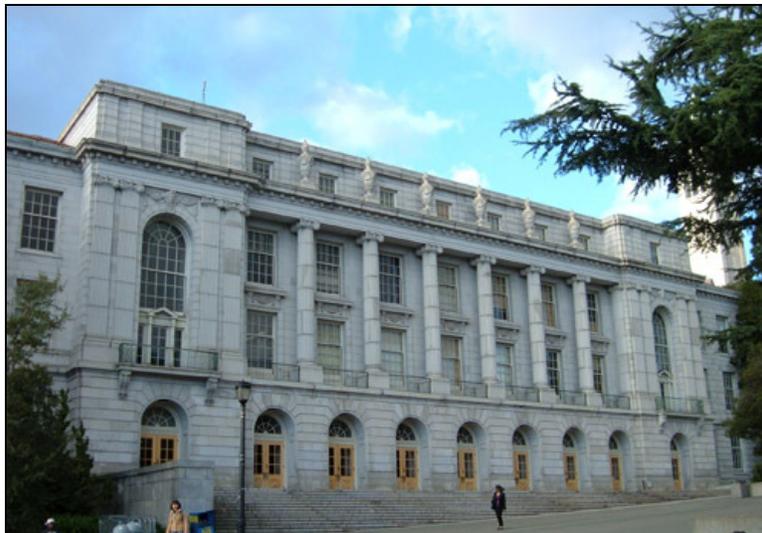
Pre-humans and humans were more likely to survive if it felt right to them when they saw an entrance that was about one-third the size of the structure, so this scaling of whole to part became embedded in human psychology.

The illustration on the following page shows a very ordinary traditional building that uses a hierarchy of scales with this ratio. The building is divided into five sections. The central section, bays, and outer sections are each divided visually into three subsections. Many of the windows within each subsection are divided into three sections. This building would seem cold and impersonal if it were just a box with plate-glass windows, but because it is divided and subdivided, it has a comfortable, intimate scale.



This example uses the ratios of three-to-one repeatedly, but most traditional buildings use a variety of ratios, ranging from two-to-one to five-to-one: the point is that the building is broken into sections, each section is broken into subsections, and so on until we get to the human-scale elements such as doors and windows.

Though most traditional architecture uses ratios ranging from two-to-one to five-to-one, because they make the building feel comfortable, monumental buildings often use higher ratios because they want to feel imposing rather than comfortable.



In the illustration above, for example, the central section of the building is divided into seven subsections, and this higher ratio helps create the building's monumental effect.

## ***Consistency with Variation***

A key principle of today's traditional urbanism is that the urban fabric should be made up of buildings that are generally consistent in style but are not identical. There should be individual variations within a general consistent framework. Andres Duany and many other New Urbanist planners have created urban codes and design codes that generate this sort of consistency with variation.

Settlements among the earliest humans must have been similar. Our earliest human ancestors were nomadic, and family groups spent much of their time hunting and gathering away from the rest of the tribe, so they had large areas of land to support themselves. But we can speculate that the entire tribe came together periodically so children could marry outside of their families, because choosing mates from a larger group of people creates enough genetic diversity to avoid inbreeding and genetic disease.

The sort of temporary settlements that people built when tribes came together must have combined individual variation with general consistency, because each family built its own shelter but all used the same materials and the same tradition of how to build. The teepee village in this 1892 photograph illustration gives some idea of what it was like, though the structures were undoubtedly more flimsy before the needle was invented.



Evolutionary psychology provides an obvious reason for why people find traditional urban fabric attractive: during the period of evolutionary adaptation, if people were attracted to the temporary settlements with larger groups of people and more genetic diversity, they had a better chance of finding mates and producing healthy children. Thus, evolution hard-wired us genetically to like settlements that have individual variation and general consistency.

This sort of urban fabric remained common during most of human history, from the earliest vernacular and traditional cities and villages until the earliest twentieth century. Here, too, buildings are similar in overall massing but different in detail.

This is necessarily the way that traditional vernacular urbanism was built. There were only a few available materials and there was a local tradition of how to build, but each family built its own house, so there was individual variation within general consistency of design.



Into the nineteenth century, most towns were still built with this sort of consistency with variation, because buildings were constructed individually using the same local building materials and following the same cultural ideal of the proper style.

During the twentieth century, though, we abandoned this timeless way of building for two reasons. First, larger scale development let us create mass-produced settlements in the style of Levittown, where each building is identical with surrounding buildings, with no

individuality at all. Second, new technologies let us create modernist buildings that broke completely with the surrounding context, with no consistency at all.

The New Urbanists have shown that it is possible to avoid both these errors by using form-based codes, which create an urban fabric with the same combination of individuality and general consistency that we find in traditional cities and towns.



The most famous examples are walkable suburbs such as Andres Duany's Seaside, because there have been more opportunities to develop new suburbs than to develop other types of neighborhoods. But Duany's Transect makes it clear that the same principles apply to neighborhoods at all densities, from small rural towns to dense cities. We can see from the illustration that Seaside has the same sort of variation with consistency as the vernacular Mediterranean town shown above.

## ***Symmetry***

A final principle of all vernacular and traditional architecture is so obvious that it is not often mentioned: symmetry.

The evolutionary reason that we feel comfortable with symmetry should be clear. If our early ancestors found symmetrical structures pleasing and built themselves symmetrical temporary structures, then their structures were less likely to fall down, so they were more likely to survive.

But notice that the principle of symmetry and the principle of consistency with variation contradict each other. If there are variations within general overall consistency, then there is not perfect symmetry.

At the level of the individual building, both are common. We are comfortable with symmetry, as in the illustration below, which shows that symmetry is used not only in imposing monumental buildings but also in work-a-day vernacular buildings.



We are also comfortable with consistency with variations, as in the illustration below.



Any individual building that we use today is much larger than the temporary structures that Paleolithic hunters and gatherers built for themselves, and it seems that we can view a building either as a single structure that should be symmetrical or as a sort of village, that should have consistency with variations.

At the level of urban design, larger than the individual building, we are comfortable with consistency with variations. In some cases, traditional urbanism uses symmetry at the level of urban design to create places that are imposing and formal rather than comfortable, such as St. Peter's Square, but this is done in a relatively limited area within a varied urban fabric.

At the level of parts of the building, smaller than the individual building, we are comfortable with symmetry. The submasses of traditional buildings are almost always symmetrical, though occasionally a large submass might be asymmetrical to give a quaint and rustic effect. Smaller elements such as doors and windows are always symmetrical. These small elements are similar in size to the temporary structures that our Paleolithic ancestors built, so our feeling for symmetry applies to them without reservation.

### ***Why Modernism Makes People Uncomfortable***

These three principles are just a first attempt to explain the timeless way of building using evolutionary psychology. But they do explain enough to let us see why modernism creates places that make people uncomfortable.

Most modernist architecture violates the first principle because it does not have a hierarchy of scales between the entire and elements such as windows. At worst, as we can see in building by Mies van der Rohe that is shown on the next page, there are no intermediate masses between the scale of a very large building and a scale of individual elements such as windows. The architect deliberately makes the spandrels between the windows as thin as possible, so the entire building seems to form a single mass.



The repetition in this modernist building goes far beyond the ratios that are sometimes used in traditional buildings to create an imposing, monumental effect. Rather than feeling monumental, the building feels completely inhuman.

Most modernist urbanism violates the second principle because it has exact repetition on the urban scale, rather than consistency with variation. This feels oppressive in popular modernist urbanism, in the style of Levittown, with identical buildings that look mass-produced even if they have traditional elements. It feels even more oppressive when the individual buildings are themselves in the inhuman modernist style, as in urban housing projects of the 1950s and 1960s, such as Cabrini-Green.



In a rather desperate attempt to get away from the monotonous, repetitive feeling of this mid-century modernism, today's avant-gardist architects violate the third principle by creating free-form buildings without symmetry even in their smallest elements, such as the building by Frank Gehry that is shown below. These buildings are not as boring as mid-century modernism, but they are even more inhuman.



These buildings ignore the first principle, because they do not have a hierarchy of scales ranging from the building as a whole to human-scale elements such as windows, with the proper ratio of whole to part at each level of the hierarchy. Though they break up the building into random fragments, they have large blank-faced areas of a single material within each fragment, rather than dividing the fragments into subsections.

They ignore the second principle of consistency with variation, because they are so individualistic that there is no consistency at all among them or between them and their context. They violate the principle of consistency with variation in just the opposite way from mid-century modernist urbanism with its identical buildings.

They even ignore the third principle of symmetry. Because they are asymmetrical, they attract attention to themselves and sometimes become media sensations, but the people who have to use them sometimes complain that the buildings are so uncomfortable that they give them feelings of vertigo.

The version of modernism practiced by today's starchitects is as far as anyone has ever gotten from the long tradition of vernacular and traditional building that makes people feel comfortable because it is in keeping with human nature. They want to build sculptural icons that attract attention to themselves, rather than building good places for people to be.

By contrast, today's traditional architects and New Urbanists are reviving the timeless way of building that suits human nature, designing buildings and neighborhoods that have small elements that are symmetrical, that have the proper scale of whole to part, and that have individual variations within a generally consistent framework.

**CHARLES SIEGEL is the author of many books, including *An Architecture for Our Time: The New Classicism and Unplanning: Livable Cities and Political Choices*. You can contact him through [www.preservenet.com](http://www.preservenet.com).**