Gestalt Principles

Gestalt psychologists have long contended that man's perception is organized around innate responses to configurational wholes and not necessarily to individual elements. Their contentions are based on exhaustive tests which have isolated a set of principles of perception. Some of these are of great interest to the architect because they describe how a visual organization will be perceived, and how the architect can affect one's perception of a building. We can use the Gestalt principles to give visual meaning (organization) to an architectural composition and to realize our concept of the building in relation to its functions and the environment in which it is placed.

FIGURE GROUND:

"The first and simplest configurations are qualities on a ground. All visual forms possess at least two distinguishable aspects, a figure portion called figure and background called ground. ...Figure and ground have certain contrasting properties: figure occupies an area that is smaller than that of the ground; figure has distinguishable parts, ground has none; figure has contours, ground is boundless; figure appears to be near to the observer, ground ap-
pears to extend behind the figure unbroken by it; figure has thing-like quality, ground is formless, diffuse, infinite. In short, figure is more strongly organized than ground." In architecture, figure and ground qualities are directly related to the observer's field of view and his distance from the object. Thus, figure ground qualities of the environment are continually changing, i.e. dynamic. However, contrast between architectural elements can enhance our perception of one of them as a figure thus giving it accentuated importance. This can be accomplished inside as well as outside the building envelope.

CENTER OF GRAVITY

Forms have centers of gravity.
"Visual forms may possess one or several centers of gravity about which the form is organized. The center of gravity exercises an inordinate influence upon the form."

The centers of gravity in an architectural composition can be manipulated to elicit a strong sense of differentiation between its parts.

GOOD CONFIGURATION

Our perception (understanding) of the environment always involves the simplification of it. We abstract its essential form and organize it into simpler wholes. Thus, the Gestalt psychologists say "...form will al-

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\[7\] Ibid. p. 133

multiple figure/ground.
Aigues-Mortes
Medieval
Southern France
RB

Centers of gravity.
Form intersection.
Barn
Florida
NA

Figure/ground.
'good' form.
static mass.
Chicche-Itza
Pre-Columbian
Yucatan, Mexico
Aztec
FJ

\[7\] Ibid. pp. 124-126
ways be as 'good' as the prevailing conditions allow. ... 'good' here means regular, symmetric, simple, uniform, close, showing uniform direction--in short, exhibiting the minimum possible amount of stress." Our simplifying of the environment into understandable wholes follows these other Gestalt laws:

LAW OF SIMILARITY: "Visual pattern elements that are alike tend to form groups."

LAW OF PROXIMITY: "Visual pattern elements having smaller distances between them tend to group together."

LAW OF GOOD CONTINUATION: "If there are several alternate ways in which a pattern element may be included in the total pattern, the simpler and more regular way will be chosen."

LAW OF SYMMETRY: "Symmetrically located pattern elements will tend to organize themselves and associated elements into groups."

Knowing that such types of configurations are seen as groups of related elements, we can use these principles to design those relationships we want to be apparent. And conversely, we can de-emphasize undesirable relationships by eliminating the characteristics that induce this understanding. For example, suppose we need to place two elements in close proximity but prefer that they not be perceived as...
being related. In this case, we might try to group each element with a different set or other elements by providing good continuation and similarity among the elements within each set and, poor continuation and dissimilar form between the sets. Hierarchies of relationship can be developed by careful manipulation of Gestalt relationships and contrast. In the sequential viewing of a building, groupings may form and dissolve as we change our orientation. Gestalt tests have proven that "visual forms may fuse to produce new ones; simple forms fuse more easily than complex ones; forms of the same strength fuse more easily than forms of different strength."

And finally, the Gestaltists have identified two additional phenomena of perception which prove to be very powerful tools for the architect. The first is CLOSURE: we tend to perceive incomplete forms as complete or closed. Architects use this tendency to make a space function both as a place and as part of a continuing composition; the place is defined by implied closure while continuity is developed in accordance with the principles of perception. The second phenomenon is the LAW OF REPRODUCTION: "Visual forms leave after-effects that make them easier to remember than other, non-configurated wholes. If only a part of a form reappears, having
appeared before together with the rest of the whole form, it will tend to reinstate the whole form." In the context of architecture this phenomenon can be used to make an environment clear and easily understandable, and is an asset in designing such places as an airport.

At this point, it is convenient to review our objectives. As architects, we are designing environments that in their final state have physical form. This form is visually understood by the society that uses it, and this understanding is founded in the Gestalt laws of perception. Our task, then, is to make the form understood as we would like it to be understood by manipulating the elements. The form of architecture is usually a composition or set of compositions whose parts are related and are perceived according to a hierarchy of order. The parts are held together by linking gestalts while hierarchies are achieved through contrast in gestalt. We will look at the hierarchies achieved by contrast in subsequent chapters.

Gestalt principles can be applied to those characteristics of architecture other than form, such as location in three dimensional space, color, texture, and mass, and culture content related to form, location, color, or mass. Man's ability to perceive depth, i.e., the location of objects in three dimensional
space is crucial to his ability to understand his environment.

Physical environments usually are perceived while the individual is moving through them. Binocular disparity and parallax combined with other depth clues give us our strongest sense of relative location of physical elements. Parallax gives us a rate of change in the environment which we associate with distance. Thus, the closer we move toward an object, the more its form is perceived to change. Binocular disparity (the views produced by the separation of the eyes) allows us similar perceptions, within a limited range of roughly 20 feet, without motion. Monocular depth clues tend to reinforce what we perceive through parallax and cultural experience. Monocular depth clues include the relative size of similar objects, linear perspective, overlap, and texture-density gradients. Relative size of similar objects presupposes a learned scale and form relationship between a number of physical elements which is then interpreted as a certain distance disparity. Linear perspective presupposes an understanding of rectangular forms and the expectancy of an observer to view them. Texture gradients imply similar expectation. Man is also quite capable of dealing with moving objects if
their motion is smooth, since most depth judgments are made in relation to rate of change of the image perceived. Thus, depth clues provide many more benchmarks for understanding the environment in Gestalt terms than do two-dimensional pictures. Proximity, form continuation, similarity, etc., become relationships we almost always see in three dimensions. There is one final depth clue called aerial perspective. It is a color gradient that affects the perceived color of buildings and landscapes. The atmosphere has color, and this color combines with the color of an object. The more atmosphere between an object and a viewer, the greater the degree of atmospheric color saturation. Thus, the amount of dilution of the object's actual color by atmospheric color gives us a depth clue. Color in architectural models tends to be misleading because it does not compensate for aerial perspective.

Color as a characteristic of architecture also can be manipulated to form gestalts that express desired visual relationships. Color has three basic qualities that are perceived by the human eye: brightness, hue and saturation. These qualities are transmitted to the eye via light reflected from the environment. Intensity or brightness "is the amount of physical energy pre-
sent in the light." The hue (color) is produced by specific wave lengths of light. Saturation refers to the purity of the color, and a single wave length of light provides the greatest saturation of one color. The Gestalt law of similarity implies that if two colors have the same saturation or intensity they will seem to group. The law of (good connection and) continuation implies that if color hue, saturation or brightness change at an even rate from element to element, the elements will be perceived as a related group. Conversely, a grouping effect can be eliminated by contrasting all of the three qualities of color. In addition to the gestalts that can be produced using color, there are other effects of color that cannot be disregarded by the designer. "Color affects muscular tension, cortical activation (brain waves), heart rate, respiration and other functions of the body, and also arouses definite emotional and aesthetic reaction." Colors can be divided into categories of warm and cool. Reds and yellows seem warm, while blues and greens seem cool. White is cool. Warm colors produce excitation, while cool ones relax. Warm colors are perceived to advance, while cool ones recede. Relative brightness also affects our perception of an environment: the brighter the more exciting,
the darker the more sedentary and relaxing. Thus, if we wish to design a relaxing bedroom, we should choose a cool color with low brightness. Conversely, an active kitchen might require a bright yellow.

Colors are symbolic as well. In the United States, red symbolizes danger, while in India and Japan it symbolizes long life. The color of a cultural symbol can be its primary characteristic; for example, in Morocco, the mosques are identifiable by the green color and their tile roofs. It must be noted, however, that a color, to be symbolic, must fall within the prescribed range of hue, saturation, and brightness.

A sense of mass is another dominant characteristic of architecture and architectural materials. A sense of mass is a feeling for the interrelationship of material characteristics and their combination. We learn a material's weight per quantity, its hardness or softness, its texture, size, etc. We combine this information to sense mass. Our perception of mass is relative to past experiences and to the physical context in which we are seeing an object. The most massive form of any particular material is a solid volume; the larger the more massive. It is perceived as less massive as
it is punctured or hollowed out. Mass is also a sense of the gravitational force on an object, and in relation to this it has an implied rest state, i.e., on the ground, and a dynamic state, i.e., above the ground. Objects can be related by having similar mass, or a hierarchy of elements can be implied by a hierarchy of mass.

We have looked at form, location, color, and mass of an object as variables the architect can manipulate to produce desired interpretations of that object. However, Gibson is correct when he says "Perhaps we should conceive of form not as a thing but as merely one of the variables of things. The projected shape of a perceived object would then be only one of its visual qualities among others such as slant of its surfaces, its size, its color, its texture, and its distance, all of which can vary continuously along a scale or dimension." We sense the totality of an object above and beyond its individual characteristics. The design process is one of balancing characteristics to produce a total effect. We can manipulate characteristics that contrast or blend in a grouping of objects to alter the relative meaning of each object. We may produce dominant sensations by using extremes of one characteristic while maintaining
neutral degrees of others. This can be accomplished with an individual element; however, it is usually employed in composing a number of elements: one uses Gestalt relations to hold the composition together while using contrast to identify significant places within the composition.

And finally, and most importantly, we must return to the concepts of meaning and expectation. We have cultural and contextual expectations of our environment. We have come to expect standard door sizes, ceiling heights, amounts of illumination. When we see them, we take them for granted, and their significance is diminished. As the context varies, expectations may vary. In the summer, one may expect comfort from a cool-toned, hard-surfaced, open environment, while in the winter comfort might be expected from a warm, highly textured, close environment. An environment may be designed to alter one's emotional state or affect one's sense of well being. Departures from expectation stimulate the viewer. For example, feelings of monumentality or coziness can be elicited through surprises of scale. Architecture is the delicate balance of meaning associated with the built environment. The meanings may be intrinsic to our way of seeing (Gestalts) or they may be culturally or emo-
tionally significant. The architect uses all the characteristics of an object—form, location, color, mass, cultural and emotional content to produce a single totality. A great architect accomplishes this without waste.