BLOCK - MARTINEZ

CHAPTER 1

Introduction: Seeing and Perceiving

It takes very little for us to see, or rather to recognize and label something. In the most ordinary sense, seeing means using your eyes to tell you that a certain thing is in a certain place at a certain time.

The first function of our eyes is to give us the information about our surroundings that we need for survival. We use our sight to keep from bumping into objects, to find food, and to spot potential danger so that it can be avoided.

As long as we are concerned only with the immediate, practical matter of avoiding an accident, we need only a little information, not much more than a bat gathers by bouncing sound waves off objects and surfaces. In fact, many people think of their eyesight as nothing more than a tool for avoiding mishaps and for orienting themselves. They discover, when asked, for example, to recall the details of the face, clothing, or hair color of a purse snatcher, that people with two good eyes often miss seeing things. As important as survival functions are, it is worthwhile to examine just how rich and complex an activity seeing really is.

There is a special poetry to sight which thoughtful people have sensed for thousands of years. The Greek philosopher Plato thought that the eye shot out a warm beam, like the beam of light from a lighthouse, which probed and flowed over the world of objects. Although we now know that our eyes do not give off rays, but rather gather and interpret the light that reaches them, Plato's explanation does have a kind of poetic truth to it. The artist Paul Klee, thinking in a similar vein, wrote, "The eye, like a grazing animal, feels its way across the surface." What he meant was that people really do use their eyes to feel the texture of sandpaper or velvet, to walk through a distant landscape, to understand how a piece of furniture is put together. Vision thought of in this way is indeed like a probe sent out to help us understand and think about the world around us.

Seeing, then, is an active exploration. Whether we are looking out of a window or trying to draw, the eye functions as an outpost of the brain. In fact, seeing is often the same kind of struggle—the attempt to put pieces together, the discarding of answers that don't work, and the forging of new connections—that we usually associate with thinking. The brainwork that we bring to bear when solving a mathematical problem or trying to figure out why a child has a stomachache follows the same routine that our vision goes through when we try to make sense out of a tangled landscape.

We call this kind of complicated and inventive seeing, *perceiving*. Perception is not the special property of artists. Although we may not be aware of it, we see creatively in the most everyday situations, and while what artists do is often a more intense and conscious kind of perceiving, it is not basically different from the ability that most people have.

Perception and art making are what this book is about. We are not primarily concerned with the science or mechanics of vision, although we touch on both. This text is concerned with how visual structures can be consciously organized and put together, and how the systematic manipulation of graphic elements and forms can influence the way we perceive them. We will discover the ways in which some artists have found the forms needed for the things they wanted to express.

We can begin by looking briefly at the physical process, the mechanics of seeing and the structure of the human eye (fig. 1.1). The inside of the eye contains a curved surface called the retina,

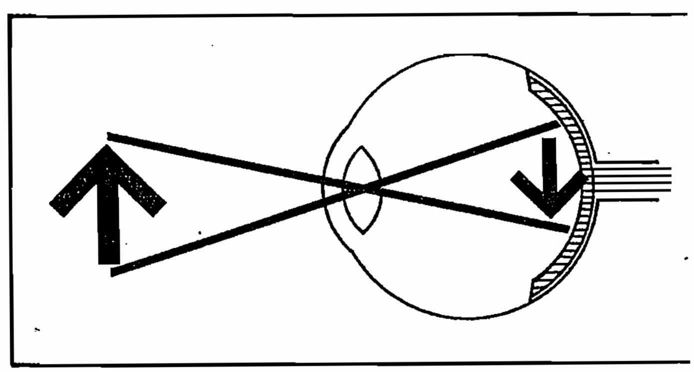


fig. 1.1. Structure of the eye.

made up of millions of nerve endings, each one of which actually a tiny light receiver. In this respect we can think of t retina as a projection screen for the eye. We can envision t nerves themselves as many tiny filaments, which weave togetr to form the larger bundle called the optic nerve, just as ma strands are woven together to form a rope.

The lens of the eye, like the lens of a camera, projects image, a pattern of light and dark, onto this screen of tiny rece tors. The image thus received by the retina is translated into mosaic of millions of messages as each nerve ending registe some amount of light. An image made up of many dots of blac white, and grey (fig. 1.2) is one possible way of visualizing (or very much larger scale) the pattern of light and dark messages tr plays over the retinal screen.

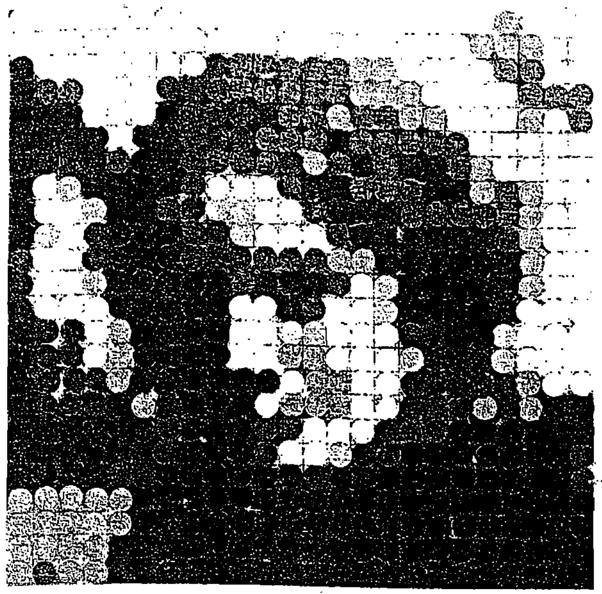


fig. 1.2. Dot image (student project by John Page).

Other things happen in the retina, especially when we look colors, but for the purposes of our discussion here, we can sume a black-and-white world. As figure 1.1 shows, the lens of e eye, like any lens, turns the image of the thing seen upside own and projects it onto the retina inverted. This inverted im-ge/message is carried through the many strands of optic nerve to e brain and is read right side up.

This is perhaps the first easily recognizable instance of a basic fact of perception: the brain has a remarkable ability to take the information gathered for it by the eye and to alter, unscramble, and rearrange it according to its needs. It can even compensate for deliberate distortions forced on it, as the psychologist Ivo Kohler dramatically demonstrated in the following experiment.

Kohler had volunteers wear prismatic goggles that projected distorted images onto the retina. People wearing these goggles saw a "rubber world," in which everything bent, stretched, and shrunk as the wearer's head turned. The subjects wore the goggles continuously for long periods, and Kohler found that after a brief adjustment period, his volunteers were able to see normally, without distortion, even though the goggles were still sending scrambled information to their eyes.

Many people have experienced something similar when trying to adjust to a new pair of eyeglasses. After a few days, during which everything looks curved or elongated, too close or too far, the distortions seem to disappear.

Our eyes, we find, are not simply passive receivers of messages, blank projection screens for the lens. They are, rather, a part of the brain, and seeing is not merely an optical process. Seeing is a part of thinking, and the mind will organize what we see and influence how we see whether we want it to or not.

For example, when we look at a ball our retina receives information only from about one-half of its surface, but we perceive the entire sphere (fig. 1.3). We are not tricked into believing that we are looking at half of a ball. We translate or complete the two-dimensional image projected onto the retinal screen to understand the three-dimensional fact of the ball.

discoveries eventually became the basis for the teachings of the Gestalt school of psychology.

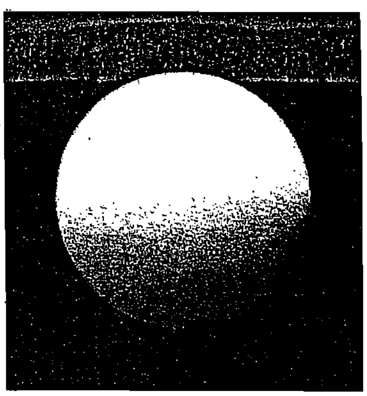


fig. 1.3. A sphere.

The brain helps the eye to interpret and order information in other ways. A printed word or a newspaper headline held a little too far away to be legible can suddenly be read when the viewer is told what it says. We all know that our eyes often play tricks on us. When searching for a friend in a crowd, for instance, we may see the expected face again and again, only to have it disappear as we look more closely.

Artists and thinkers from Leonardo to Newton, from Goethe to Seurat, have been interested in perception, but the groundwork for a really systematic approach to the subject was laid in the late nineteenth and early twentieth centuries by a number of scientists and psychologists. Although many of these early researchers were not, strictly speaking, Gestaltists—the word Gestalt was first used to label this line of inquiry in 1890 by an Austrian psychologist, Christian von Ehrenfels—their ideas and

These scientists began by simply trying to find out to what degree our sensations could be quantified, weighed, and measured. In a typical early experiment, Gustav Theodor Fechner tried to discover exactly when an increase in illumination became noticeable to the eye. In a darkened room, he lit one candle. He then asked an observer to raise a hand whenever the addition of another candle seemed to make a noticeable difference in the overall brightness of the room. He discovered, remarkably enough, that a room lit with three candles did not seem lighter when a fourth candle was added, but that a fifth candle created a difference that could be recognized.

Further increases in light (which Fechner called JNDs, for Just Noticeable Differences) were noticed when the number of candles reached eight, thirteen, and twenty-one. This sequence, 3, 5, 8, 13, 21, is a logarithmic progression (sometimes called a Fibonacci series, after a Renaissance mathematician), a numerical series which often appears in the proportions of natural forms, such as pine cones, and Fechner's demonstration seemed to show that aspects of our nervous system are somehow governed by numerical relationships.

Explorations like these eventually resulted in the Gestalt psychologists proposing, and attempting to prove by experiment, several apparently simple hypotheses about how we see and interpret the information brought to us by our senses.

The central concept is the notion of *Gestalt*, from which the group takes its name. This is a more or less untranslatable German word, commonly rendered in English as "shape" or "form," but also encompassing the ideas of pattern, configuration, or wholeness.

The Gestalt theory of perception holds that every perceptual experience is an event that has a quality or qualities different from (not more than) an adding together of the parts. This understanding of how perception works applies consistently to all the processes of our thinking and our senses. A poem has a different meaning than does a list of the words from which it is made; the sense of the words depends on the order in which they appear, on their position as part of a larger whole. Similarly, a melody feels very different from a listing of the notes of the musical scale. Play three notes such as C, E, and G together on a piano. What you hear is a chord with a certain quality or feeling. Play the same notes separately, and what you hear will be entirely different. The painter and color theorist Hannes Beckmann pointed out that a landscape is not merely grass plus trees plus clouds plus other details. It is a distinct percept or experience, with a quality all its own. When put together, the parts are actually changed (fig. 1.4).

We can always note the parts of the whole, but we must also be aware that they are brought together in a certain order. Disturb this order and the quality of the whole changes. A melody is a pattern of sounds made by arranging notes in a certain sequence with silences in between them. The notes themselves can be transposed into another key without destroying the melody (try whistling "Yankee Doodle," first starting on a high note and then starting on a lower one), but the melody will be destroyed if the

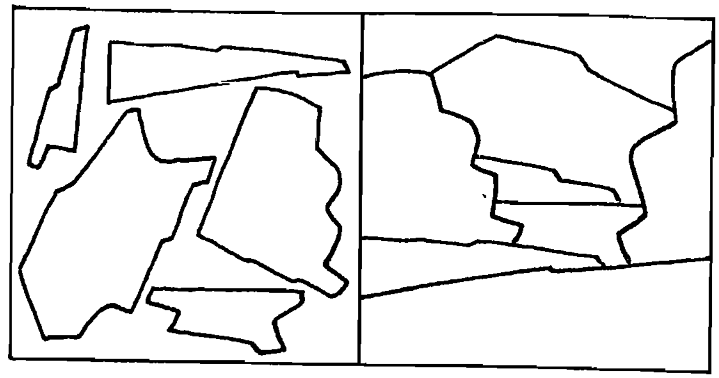


fig. 1.4. "Parts" of a landscape.

order of the notes or the lengths of the silences between them are changed. It is the relationships between the parts, as well as the parts themselves, to which we respond.

Wolfgang Kohler demonstrated the importance of relationships in perception in a simple but ingenious experiment. He placed chicken feed on a white sheet and a grey sheet of paper, and then trained chickens to eat only from the grey sheet. Having done this, he presented the animals with a new situation: two feed piles, one on grey paper and one on black. Kohler wondered whether the chickens would continue to respond to the simple fact of the grey paper, or whether they would decide where to feed on the basis of the more complex perception of which paper was lighter and which darker.

Given this new choice, the chickens ate from the black paper three-quarters of the time, clearly responding to a comparison between lighter and darker. Kohler correctly concluded that relationships dominate perception, even in simple animals.

Obviously, with all this talk about candles and chicken feed, it's not difficult to realize that the Gestalt researchers were not art historians or art critics. They were not specifically interested in developing techniques by which painting and sculpture could be analyzed. Visual art, however, has served as a heightened and complex demonstration of Gestalt principles. Artists have for thousands of years been aware of the importance of wholeness and of the significance of the relationships between parts within their own work. They are usually, however, more concerned with the work of art itself than with writing and talking about the connections between the senses and the mind. But artists have very practical problems to overcome in making art which do make this line of thought relevant.

One problem is common to all the visual arts except photography. A painting is made piece by piece, or mark by mark. A sculpture, whether modeled in clay or assembled from separate elements, is also made piecemeal, and the same is true of a page layout or logo design.

Often, the vision of the finished work is clear to its maker from the beginning. The landscapist may be struck by a view that looks exactly right, and is able to imagine the picture as it will look when finished. But the actual making of the painting may take hours or days, and by the second or third hour of hard looking, the painter, like a person whose eyes adjust to a darkened room, has noticed many things which were not seen in that initial glance. It becomes tempting to try to put it all i Somehow the original impression, received and felt in the fi moment, is now in danger of being buried under these oth details and nuances, and the artist has to fight to keep the origin whole perception from becoming engulfed by them.

The designer, working to lay out a page of type and image may begin with a whole series of bits and pieces: a block of te a line of larger type, a square photograph. By arranging t pieces in many different ways, by adding, taking out, and chan ing, the designer seeks the order that expresses the intend meaning most clearly.

So, bit by bit, the work of art is made, while the artist tries keep a "third eye" on the vision of the finished work.

Artists have been interested in and comfortable with Gest theory from its beginnings because it offers another way of unde standing the struggle between the parts and the whole that is much a part of what happens in the studio. But Gestalt theory a its specific applications in this book are not formulae or rules f making art. They do not explain what artistic creation is or how happens. What they do is allow us to understand some simp elements of cause and effect that are among the tools that arti use: a certain organization will result in a certain look; convers ly, a certain look will always be caused by a particular organiz tion of elements. Very often, these principles will tell us what n to do, rather than give us recipes for good composition or plea ant color.

If we are to understand what a piece of design, a painting, a sculpture is saying, we need to understand its visual languag ꞓ grammar, the rules, of visual language, a language of shape, or, direction, and other elements, is part of what this book will dress. We will be stressing that phenomena as basic and imme-te as candles in a darkened room are at the core of complex rks of art, and that simple visual forces often form the armature t supports a complex construction in which meaning and form interwoven.

For most of this book we would like to put aside the ques-n, Is it art? and substitute the more objective one, How does it rk visually? We would like to look at how visual elements can controlled and manipulated so that making and looking at ual objects can be, as much as possible, a conscious activity. want to stress that, as artists, we are allowed to use the nscious parts of our minds as well as the unconscious.

In speaking about works of art this way, we are also address-; a prejudice often expressed in discussions of creativity. For ny people, emotion (or instinct) and intellect (or con-ousness) are opposite, mutually exclusive categories. This idea sometimes expressed in other terms; the artist (creative person) sus the scientist (thinker), or the Classicist temperament (cere-l) versus the Romantic (emotional or impulsive). Sometimes assumed that in order for one part of us to work well, some other faculty must be a little atrophied; that those who use their minds and those who use their eyes are two different types.

In fact, vision and the ability to think are wonderfully inter-woven and complementary. By finding out how perception works, we can begin to realize that when we are thinking clearly about our work, we are also feeling most intensely, and that when a work of art is badly organized, its expressive qualities suffer.

By concentrating on an analysis of visual forces we stand to gain something that is immensely important to us as artists—the ability to step outside of ourselves for a moment and to look at our work, not as an expression of our deepest selves, or as a child to which we have given birth, but as something apart from our-selves, made of paint, or letter forms, or pieces of welded met-al, and subject to some clearly understandable and universal laws.

In doing this, we learn to become our own critics, rather than to depend entirely on the responses of others in trying to judge our work. We are also made free to draw conclusions about visual art in general, not merely on the basis of personal taste, but in terms of a visual language upon which we can all agree.

CHAPTER 2
Simplicity

TO CLOSELY EXAMINE AN ACTIVITY OR PROCESS, we may proceed by breaking it down into its various aspects, each to be examined separately. This often helps avoid the confusion that results when many ideas or many aspects of one idea overlap or bump into one another.

For purposes of analysis such an approach is useful and necessary, but, in the case of perception, it is not entirely true to our experience. The visual environment that surrounds us is rarely as neat or clear as the diagrams that we use to demonstrate separate phenomena, and neither are most works of art. We are reminded as well of the Gestaltist's view that perception is not a matter of merely using our eyes to make a list of parts. We also see that the interaction between those parts and the meaning of each is changed when it is seen in context.

Often in a work of art we will see different visual qualities colliding, interacting, modifying, and limiting one another. Like wrestlers in a ring or acrobats in a balancing act, the play of visual forces and counterforces can be exciting and exhilarating. A theory or system helps us to understand the process of perception, but works of art are always richer than theories. It is the work that explains the theory, rather than the other way around.

There is, however, one general principle that is so many-sided, and so basic to our approach, that we can say that many other rules that seem to be clearly different from one another are really different aspects of this single fundamental law. This law is called the Simplicity Principle, and it states that our eye/brain, our perceptual mechanism, will attempt to order and interpret the information gathered by the eye in the simplest possible way.

What do we mean by "simple"? We can seek an answer to this by observing the way simplicity helps to shape natural forms. Scientists have known for some time that there is a general tendency throughout nature for forms to assume the simplest shapes that they can under the impact of the forces that operate on them.

The Gestalt psychologist Kurt Koffka offered an example of

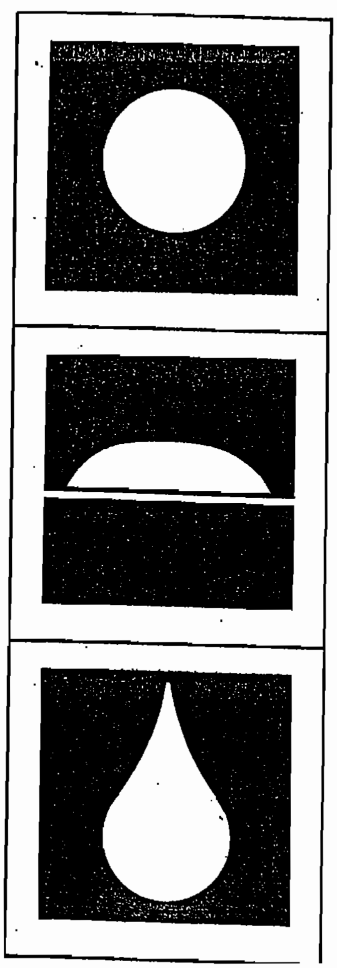


fig. 2.1. Water droplets: suspended, on a surface, falling.

this in describing the forms that water droplets will assume und different conditions (fig. 2.1). He pointed out that a drop of wat floating within another, larger body of liquid, such as oil, wi become a perfect sphere. Water drops lying on a horizontal she of glass will become slightly flattened domes, and "fallin through air they assume a new shape which, though less simpl than the sphere, is still perfectly symmetrical and fulfills the cor dition that it offers the least resistance to the air through which is passing, so that it can fall as fast as possible; in other words, th falling drop of water is perfectly streamlined . . ."

This tendency for forms in nature to find the simplest (c most efficient) organization possible is not unlike what ou eye/brain does with the problem of organizing the elements c the world we see. The Simplicity Principle governs the way w see in a fashion analogous to the way natural forces act to creat the inevitable configurations of natural forms.

We will see over and over again how the Simplicity Principl is the key factor influencing our perceptions of visual situations o many kinds. In figure 2.2, for example, the first group of dot creates a square; the second group, a diamond. When the group are combined, however, we do not see a square and a diamonc together; instead, our perceptual mechanism restructures the situation, and turns two angular shapes into a single, simple shape—a circle.

This remaking of forms with our eyes in order to see them more simply occurs in the linoleum cut *Lettres Choisies* by Félix Vallotton (fig. 2.3). Vallotton often designed his prints so that large

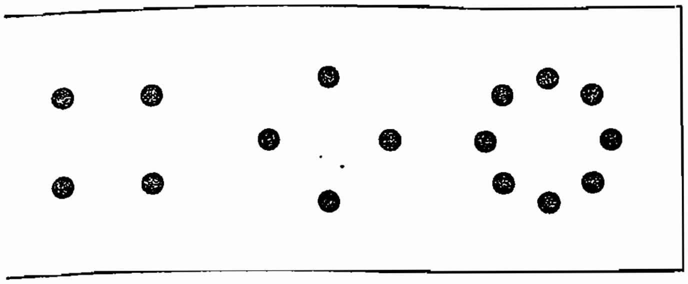


fig. 2.2. Simplicity: dots creating shapes.

center of this composition is a large horizontal black area with a complicated outline (fig. 2.4). Our eyes, however, simplify the matter. Instead of seeing one complex structure, we break the flat silhouette into two levels: we see the irregular shape of the boy's coat in front of the simple dark rectangle of the lower wall behind him. It is structurally simpler for us to visually divide up the black shape and assign parts of it to the wall and to the boy's jacket than it would be for us to trace the complicated in and out silhouette made by the flat shape.

In Joan Miró's painting, *Woman with Three Hairs Surrounded by Birds in the Night* (fig. 2.5), the tendency to see simply makes us restructure our perception in a slightly different

fig. 2.3. Lettres Choisies (Selected Letters). Illustration by Félix Vallotton for *Poil de Carotte* by Jules Renard, woodcut, 1902.

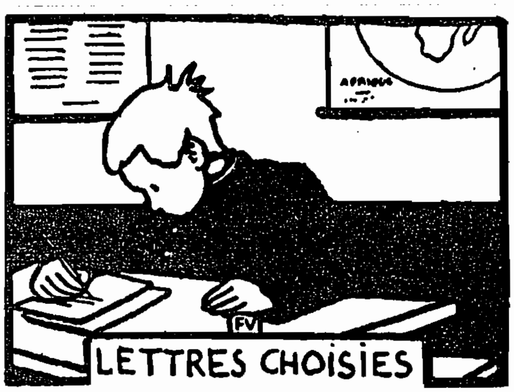
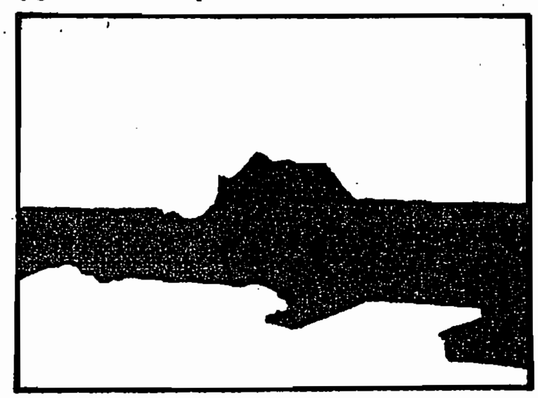


fig. 2.4. Black shape from Vallotton's *Lettres Choisies.*



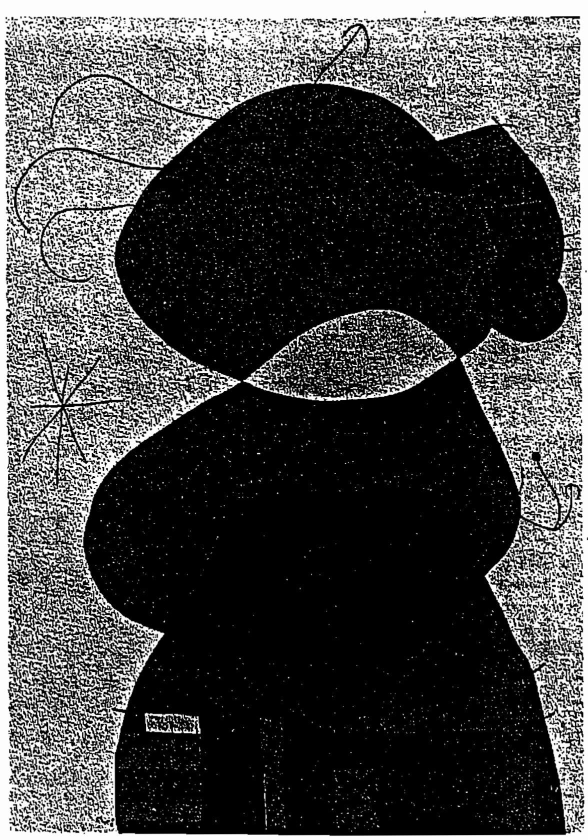


fig. 2.5. Joan Miró, *Woman with Three Hairs Surrounded by Birds in the Night.* Palma, 1972, September 2. Oil on canvas, 7′ 11⅞″ × 66½″. Collection, The Museum of Modern Art, New York. Gift of the artist in honor of James Thrall Soby.

way. A series of irregular shapes is painted, one next to the other. Seen as independent units, a circle with a bite taken out of it, an almond shape, and so forth, we have a complicated inventory of different elements. But by seeing transparency, we obtain a simpler visual event—three larger shapes overlapping one another.

Grouping is another way in which we organize and simplify what we see. Whenever we perceive separate units, things, or shapes, our perceptual mechanism will try to organize them into groups. Try beating out a steady rhythm of single beats with your hand on the table. After a moment or two, you will begin to hear the beats in groups of twos, threes, or fours.

We tend to see separate things as members of the same group when certain conditions occur. We group things together if they are the same size, shape, or color. Separate units will be seen as groups if they are close together or if they have the same orientation (if they point in the same direction in space) (fig. 2.6).

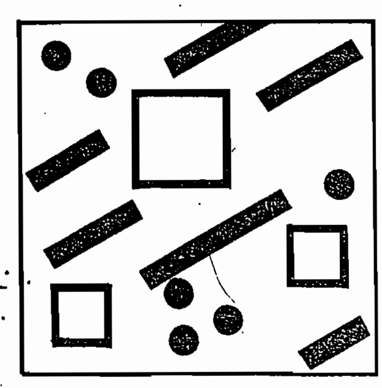


fig. 2.6. Grouping by size, orientation, proximity, and shape.

fig. 2.7. Georges Braque, *Femme Peignant* (Woman Painting). 1936. Oil on canvas, 92 × 73 cm. Courtesy collection of Consolidated Foods Corporation.

There are times when two equally simple interpretations of a visual configuration will be possible. When this happens, the eye will see now one, now the other version. In the painting by Georges Braque in figure 2.7, we see both a dark profile and a full face, tensely co-existing, each competing with the other for the viewer's attention. We are in this case incapable of resolving the ambiguity and establishing a visual preference. Here is a situation where a certain kind of ambiguity enriches the meaning of the picture.

As artists, we are not necessarily limited to dealing only with the regular and geometric forms of diagrams. We have the choice of working with elements as complex or simple as we wish. We can create a work as complicated as a Dutch still life (fig. 2.8) or as reduced as three or four shapes (fig. 2.9), but it is not the number of parts alone which makes for visual richness in an image. Rather, it is the clarity of the Gestalt, the simplicity and unity of the organization, and the interaction of colors and shapes.

Although we will be referring to the importance of simplicity and the role it plays in many different visual situations, we have to remember that simplicity is a relative term. What, for example, is the simplest possible organization for a realist painting of a crowd of people dancing in the flickering shade of a tree on a sunny day? What is the simplest possible organization for a subway map that must show ten different routes? What is the simplest possible organization for a child to use to make a drawing showing only a very unspecific quality, such as "thingness" distinguished from "nothingness"?

fig. 2.8. Jan Davidsz de Heem, *Vase of Flowers*. c. 1645. Canvas, 27⅜ × 22¼". National Gallery of Art, Washington. Andrew W. Mellon Fund, 1961.

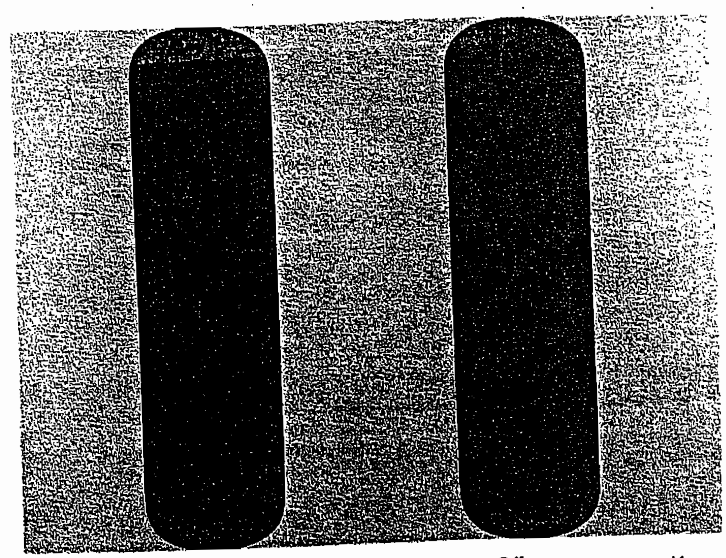


fig. 2.9. Ellsworth Kelly, *Green, Blue, Red*. 1964. Oil on canvas, 73 × 100". Collection of Whitney Museum of American Art. Gift of the Friends of the Whitney Museum of American Art.

In other words, we will often be asking ourselves: What is the simplest possible way to arrange the elements that we want to work with?

The Simplicity Principle is frequently the key to understanding many different looking visual events. It is often in our attempt to organize what we see simply that we create some of the most striking effects in the work.

CHAPTER 3

Shape

MAKING SENSE OF WHAT WE SEE is something that seems to happen naturally and instantly. We look. We see. Whether it is triangularity, curviness, or any other visual uality, seeing often seems as effortless and elementary as swal- owing a sip of water.

When we see a shape, we grasp its basic character, whether is the solid and stable look of a square or the spiky, outward rust of a pointed star. With our eyes, we feel shapes spon- neously, without having to do any special mental gymnastics or ny conscious thinking at all. In Paul Klee's words, "Every form as its face, its physiognomy. Shapes look at us, gay or severe, nse or relaxed, suffering or smiling."

Although this ability may seem to be something we are all orn with, scientists found some surprising things by studying eople who had been born without sight. People born effectively lind because of cataracts (a clouding of the lens of the eye), have, thanks to twentieth-century surgical techniques, sometimes been given sight after a lifetime of darkness. What happens when an adult is able to see for the first time?

Researchers found newly sighted adults to be almost as sensitive to changes in light and color as those who had always had vision, but distinguishing one simple geometric shape from another, grasping the difference between a square and a triangle, for example, proved a much more difficult job. For this task, the subjects often had to count and add up corners and sides in order to recognize what they were seeing. Three corners meant that the shape was a triangle. Four corners and four sides of the same length meant a square. In some cases, months of practice were required before this process of adding and figuring gave way to the quick identification of shapes that we take for granted.

What these subjects acquired, and what most people have, is the ability to grasp shape whole. This means recognizing a

general pattern of organization that governs all the parts of a shape, recognizing its face, as Klee would put it, before we distinguish individual features.

We can try to understand how we do this by closely examining one simple shape, the square. Is there anything we can say about the square itself? Any group of ten people would be likely to come up with the same kinds of words to describe the feelings that it evokes in us—solid, heavy, stable, still, or less specific terms such as brooding or silent.

In other words, we can probably say first of all that there are elementary but universal responses even to the simplest things we see; there are things, however vague, about the square upon which we might all agree.

We can examine the square in another way, considered as a flat surface, a visual field upon which shapes and marks can be placed. We then begin to see that an "empty" square is alive with forces that affect anything placed within it to a greater or lesser degree.

As we do this, we tell no story and have no subject in the literary sense, only the square itself and one or more black dots. There is no question of creating the kind of complicated deep space found in a Renaissance painting or a photograph. This visual "clearing of the decks" has the advantage of leaving us, as much as possible, free to consider the surface without regard to spatial illusions.

In figure 3.2, a dot is placed at the midpoint of the square. In this position it seems firmly anchored and at rest. The center of the square acts like a visual magnet, holding the dot firmly in its grip.

If we move the dot slightly off this visual center to the left, as in figure 3.3, it will look a little misplaced, as if it had been knocked out of the position in which it belonged, and it will appear to be drawn back toward the center. It seems to be hesitant, undecided, uncomfortable, or impermanent in its position.

As the dot moves away from the center and toward any of the sides of the square (fig. 3.4), the pull of the center weakens and the nearest edge seems to attract the dot. The dot again becomes unstable, wanting to move toward the edge. The nearer together the two elements, dot and edge, come, the stronger the attraction between them.

The force exerted by the four edges is not, however, equal. If we look even more carefully we will discover that a dot placed exactly in the center of the square (fig. 3.2) will, in fact, appear to be slightly too low and will tend to want to move a little higher up. Its position becomes the most stable when it is placed just above center as in figure 3.5. This suggests that the bottom edge exerts more pull than either the top or the left or right side. We can sense the pull of gravity at work here even though we are dealing with a strictly visual phenomenon.

If we increase the number of dots to five and locate them in different positions toward the bottom of the square, they seem to be sinking. Five dots placed near the top of the square appear to rise (fig. 3.6).

Placed near to, but not at, the center and corners, the dots want to move more exactly into these positions. If we do move

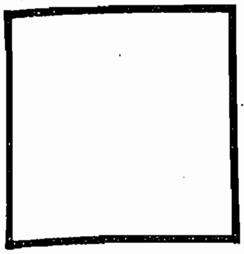


fig. 3.1. A square.

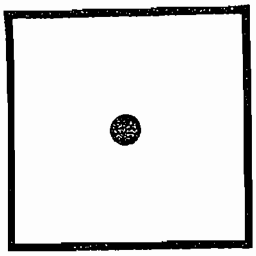


fig. 3.2. Dot centered.

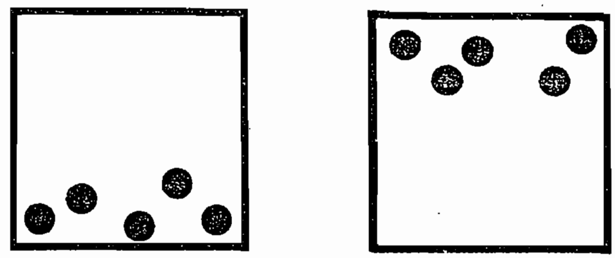


fig. 3.6. Dots sinking and rising.

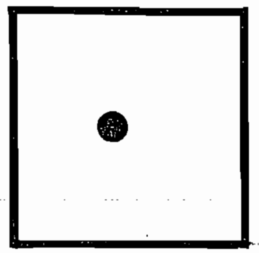


fig. 3.3. Dot off center.

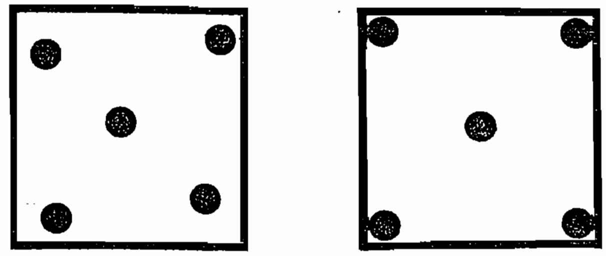


fig. 3.7. Dots near the corners and at the corners.

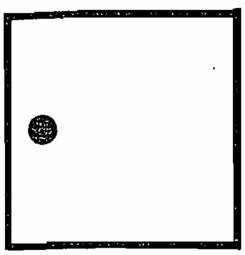


fig. 3.4. Dot drawn toward the edge.

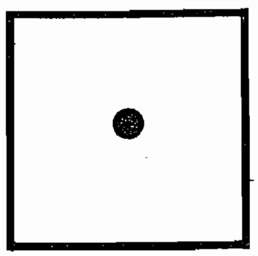


fig. 3.5. Dot at visual center.

them to the center and corners, they seem solidly anchored in place (fig. 3.7).

When dots are placed symmetrically along the vertical and horizontal midlines of the square (fig. 3.8), they gain stability and feel fixed in place, but we can still feel the visual pull exerted by the corners and sides. There is a tension to all visual balance, and even in the calmest looking arrangement, we can feel forces held in check by counterforces. Imagine a bowstring pulled taut. It is absolutely still, and yet it also looks full of restrained tension.

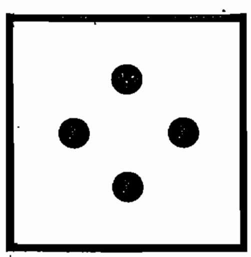
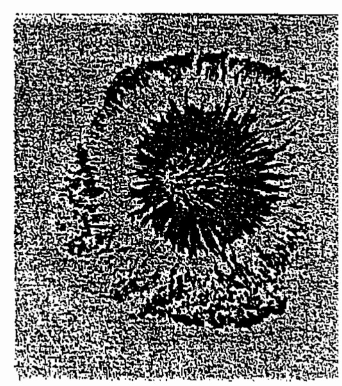


fig. 3.8. Dots symmetrically placed on midpoints.

fig. 3.9. Lines of magnetic force.



The square, then, rather than being blank and empty, is full of forces and points of attraction that make the marks in it appear more and less stable. By moving the dots around in the square, we can begin to chart and make visible some of these invisible forces. We find that there is a strong center that pulls the dots toward itself, and that there are other, slightly less magnetic points and lines at the corners and along the sides of the square. The diagonals and vertical and horizontal midlines exert a relatively weaker attraction, and the zones between these lines have the least power over the dot.

When metal filings are sprinkled on a sheet of paper under which a magnet has been placed, the filings form patterns on the paper. They align themselves along the lines of magnetic force generated by the magnet and so help to make these invisible forces visible (fig. 3.9). Our dots do something very similar. They allow us to see invisible patterns of force in a shape.

Rudolf Arnheim, the Gestalt theorist and writer who h done the most extensive investigation of art and perception, vi alizes the forces active in the square with the diagram in figu 3.10. He refers to this configuration as the *structural skeleton* the square.

All shapes, simple or complex, symmetrical or irregul contain their own particular structural skeletons. These invisib internal frameworks of directions, axes, and centers of attracti are the features which give a shape its particular character.

We can visualize this in another way by imagining a danc moving inside an elastic bag that covers the entire body (f 3.11). What we see is the surface, the outer skin of the bag, a stretches and contracts, bulges and changes silhouette. But v understand that this outward appearance is created by the int nal thrust and pull of arms, head, and legs. The contour, the thi that meets the eye, results from what is happening inside the for

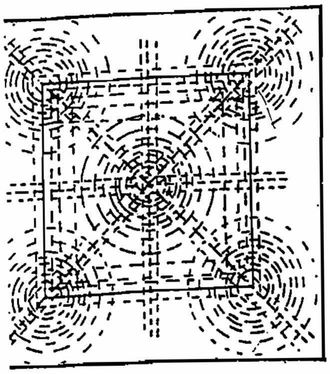


fig. 3.10. Structural skeleton of a square (from Rudolf Arnheim, *Art and Visual Perception*, University of California Press, 1974).

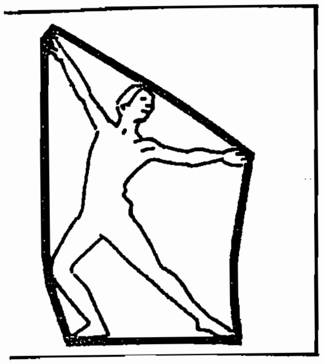


fig. 3.11. Dancer in an elastic bag.

We can see how changing the orientation of a shape might ıge its skeleton. If we stand our square on its corner, for nple, we see that the two lower sides now have more pull the two upper sides (fig. 3.12). They exert some of the same itational attraction as the bottom edge of the square. We

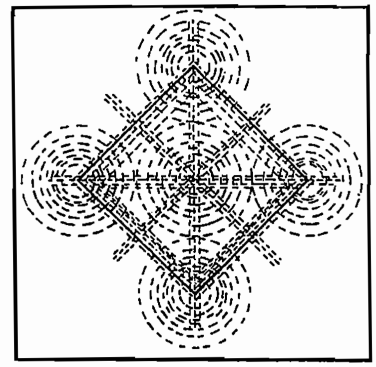


fig. 3.12. Structural skeleton of a diamond.

notice also a very definite change in the character of the shape, in its "face." It gains an entirely new look, becomes a diamond, with a new visual personality, as different from the solidity and stability of a square as a dancer, balanced on point, is different from a person seated with feet flat on the floor (fig. 3.13). Try this with any two-dimensional image. It may be easier to see at first by looking at an image that is not figurative, that has no "picture." Turn a reproduction on its side or onto one of its corners and you will notice how the shapes and their relationships change character.

Usually, when we think of shape, we think of an area bounded by a border. This border might be seen where two different colors come up against one another, or, even more likely, we might think of the border as a line, a sort of visual fence separating one area from another. A closed outline seems to be the most obvious way to make a shape appear.

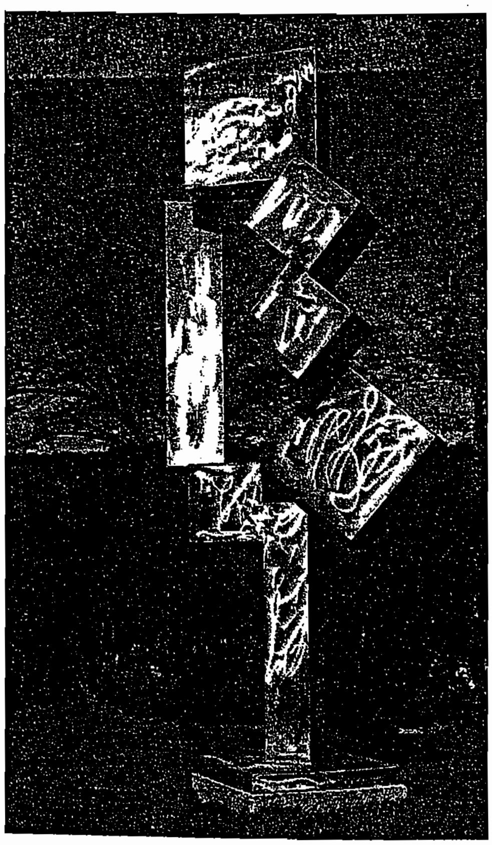


fig. 3.13. David Smith, *Cubi XII*. April 7, 1963. Stainless steel, 109⅝ × 49¼ × 32¼. Hirshhorn Museum and Sculpture Garden, Smithsonian Institution.

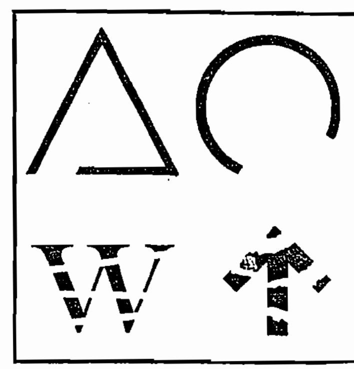


fig. 3.14. Closure.

This is only partly true. As units group together, another perceptual principle, *closure,* will often come into play. Closure is the term we use to describe a tendency for the eye to fill in gaps between lines or points that are members of the same visual group. Closure is further evidence of the fact that our eye/brain will work to create a simpler and more complete structure from a series of separate elements (fig. 3.14).

In the etching by Henri Matisse in figure 3.15, we perceive the oval of the head, even though there is no oval-shaped line to create it, only a series of small, irregularly curved lines lying close to one another. We complete this configuration with our eyes in much the same way that we completed the shapes in figure 3.14 or the square in figure 3.16.

We have seen that it is the skeleton rather than the contour which defines a shape. We can, in fact, make shapes without any outline at all in several ways.

The principle of grouping, which we examined in Chapter 2,

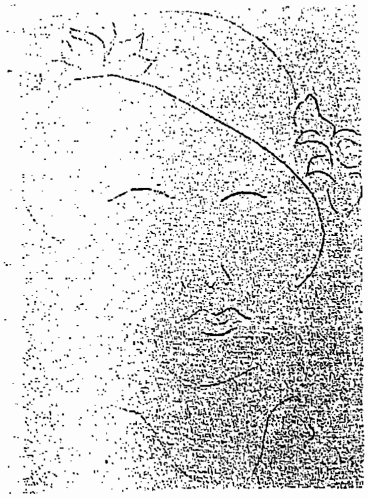


fig. 3.15. Henri Matisse, *Loulou in a Flowered Hat.* 1914. Etching, 7 1/16 × 5" plate. Collection, The Museum of Modern Art, New York. Purchase.

allows us to connect four dots with our eyes and see a square (fig. 3.16). Even more to the point, we can use this same principle to generate a shape's structural skeleton, and from that, the shape. Anyone who has ever looked for pictures in the constellations of the nighttime sky will do this same kind of grouping together and connecting (fig. 3.17). When we look at constellations, we are generally looking for the skeleton rather than the contour.

Similarly, in a typical Cubist drawing, such as *Nude Woman* by Picasso (fig. 3.18), the outer contour becomes superfluous and is eliminated altogether. The drawing maps out a whole constellation of significant structural landmarks.

So, in trying to analyze shape, we have to look at the pattern of structural features, the armature for what meets the eye. If, like the newly sighted person, we try simply to count corners and sides, we run the risk of misunderstanding what our eyes tell us and making the process of seeing more difficult than it is.

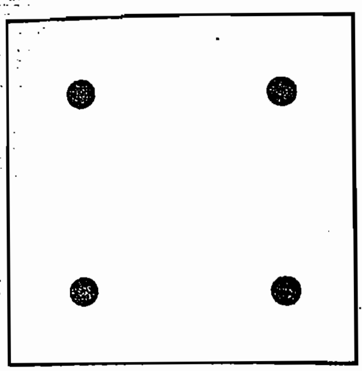


fig. 3.16. Grouping.

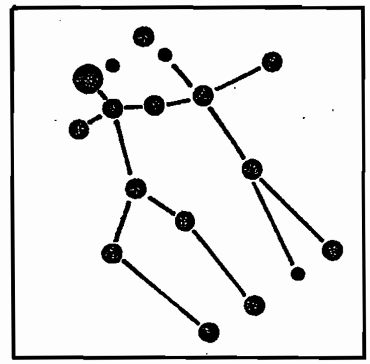


fig. 3.17. The constellation Gemini.

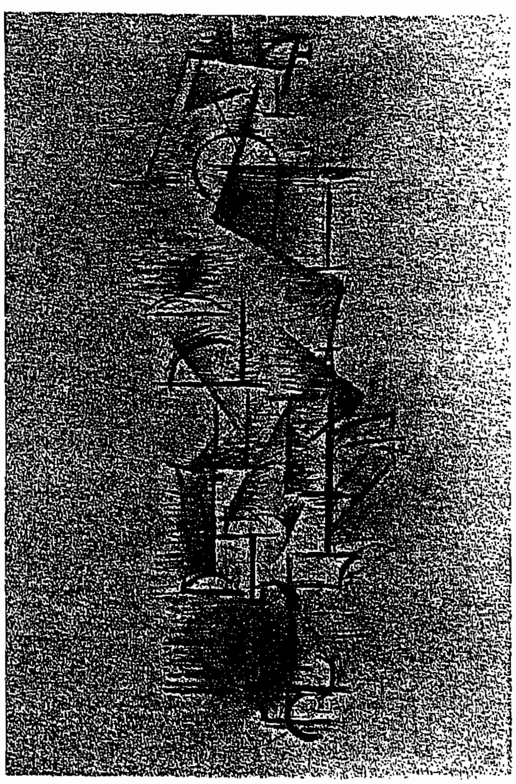


fig. 3.18. Pablo Picasso, *Nude.* 1910. Charcoal, 19 1/16 × 12 5/16". All rights reserved, The Metropolitan Museum of Art. The Alfred Stieglitz Collection, 1949.

The images in figure 3.19, a series of relief sculptures by Henri Matisse, can serve here to show how shapes reveal their structural skeletons progressively through a process of stripping down. We should not, incidentally, assume that the most simplified version of the back is necessarily the best. In this case we see a kind of tradeoff. At the far end of the scale of appearances here, we get greater purity of form and a more explicit structure, even as we lose some of the richness that the more realistic approach of the first version conveys.

The importance of this structural approach to shapes becomes even more apparent when we try to understand what makes a shape simple or complex.

Take, for example, the two shapes in figure 3.20. It is obvious that the one on the right has more parts. It has twelve sides and twelve angles while the shape on the left has only six of each. The shape on the right, however, seems simpler looking and easier to understand. Why? Because it has fewer structural features. Only one angle, 90 degrees, is used throughout, and the sides are of only two lengths, one twice as long as the other. Two directions, vertical and horizontal, govern the orientation of the sides. The six-sided figure is, by comparison, much harder for the eye to decipher. It is built from six different lengths of line, and every side slants in a different direction. Each of the six corners forms a different angle.

Try showing the figures to another person for a few seconds, then ask the person to draw each figure from memory. Which one is easier to remember? Put another way, the twelve-sided figure could be very clearly described with a single ...

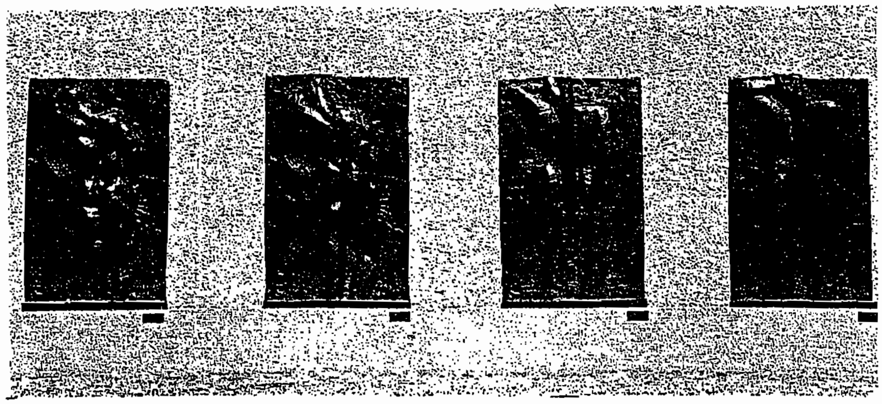
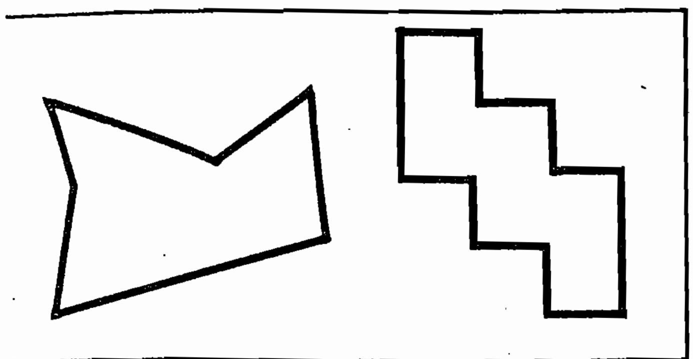


fig. 3.19. Henri Matisse, *Backs I to IV.* 1909–1930. Bronze ief, each approximately 74 × 48 × 8″. Hirshhorn Museum and Sculpture Garden, Smithsonian Institution.

fig. 3.20. Complex and simple shapes.



ment of the hands. It would take a much more complicated series of gestures to do the same thing for the six-sided figure.

Simplicity, we remember, is a quality, not a quantity. It is a word that describes the overall organization of elements, the pattern that these elements form, and not the number of them. The same number of parts may be put together in a simple or a complex way.

It follows from this that a work of art with many parts can be very simply put together. In the painting *Mary, Queen of Heaven* (fig. 3.21), a wealth of color, shape, and form is organized in a simple symmetrical pattern. Although the painting is loaded with detail, everything responds to this single organizational principle—a form on the left side of the rectangle is answered by its mirror image on the right side.

fig. 3.21. Master of the Saint Lucy Legend, *Mary, Queen of Heaven.* c. 1485. 85 × 73″. National Gallery of Art, Washington. Samuel H. Kress Collection, 1952.

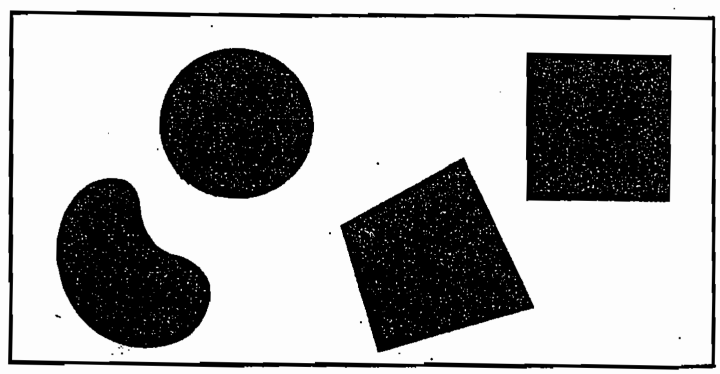


fig. 3.22. Regular and irregular shapes.

We notice, too, that regular shapes, shapes that are simple, symmetrical, and geometric, tend to be visually heavier than more complicated and irregular shapes (fig. 3.22).

Surroundings, or context, can alter the appearance of a shape in curious ways. In the painting by Amedeo Modigliani in figure 3.23, we see a stretching out of porportions throughout the picture. Arms, fingers, and nose are given a slender curviness that we recognize as part of the artist's style, rather than an accurate rendering of an elongated and curved sitter. The long neck fits very easily into this general way of seeing things. It does not, given the artist's style, look especially odd or out of place.

When Alice suddenly sprouts a long neck in John Tenniel's illustration for "Alice in Wonderland," it immediately looks incongruous because nothing else in the picture undergoes a sim-

fig. 3.23. Amadeo Modigliani, *Chaim Soutine.* 1917. Canvas, 36⅛ × 23½". National Gallery of Art, Washington. Chester Dale Collection, 1962.

fig. 3.24. Alice with a long neck (illustration by John Tenniel for Lewis Carroll's *Alice in Wonderland,* 1865).

ilar change. The elongation is a violation of the law that governs everything else in the picture, and so it seems like a distortion (fig. 3.24).

The painter Henri Matisse was thinking of the way context makes shapes look right or wrong when he remarked that he probably would have fainted had he ever met a woman in the street who had the proportions of the women in his paintings.

As we have already said, shapes are easier to understand when we stick to diagrams and simple geometric forms, but so much of what we see every day is more complicated than circle, square, and triangle, even though we live in a manufactured environment that is largely right-angled and straight-edged.

Imagine leaving the cubic room in which you are probably now sitting and taking a walk in the woods. In such an environment there is a lot to see; shapes, angles, colors, and changes in light and dark. In this continuous tapestry of sights, some things will be relatively easy for our eyes to grasp; the vertical of a large tree trunk, or a clearly triangular shape such as the silhouette of a spruce tree. But many other sights will seem to have no clear shape, and may be visible only as a tangle of underbrush or an angle that is hard to judge.

In such a situation, our perceptual mechanism will search for decisive shapes and directions, and will also strive to make ambiguous sights more clear. In a simple experiment, Gestalt psychologists have demonstrated one way in which we do this.

People were briefly shown simple shapes and patterns similar to those in the first diagram of figure 3.25, patterns that were slightly asymmetrical or irregular. Having glanced at the shapes, the subjects were then asked to draw, from memory, the patterns that they had been shown.

In the vast majority of cases, one of two things happened. People either drew the patterns as completely symmetrical, or they exaggerated the slight differences and drew them as clearly noticeable asymmetries. A pattern such as the first one in figure 3.25 would tend to be remembered as looking like one of the other two diagrams.

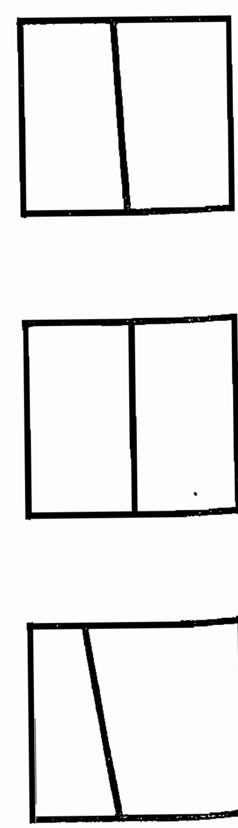


fig. 3.25. Leveling and sharpening.

These processes, called *leveling* and *sharpening,* really repre-
ent two sides of the same coin. Both are ways of making an
mbiguous or unclear image clearer. In leveling, small in-
qualities such as the difference in width between the left- and
ght-hand rectangles, or the slight tilt in the central dividing line,
re erased and seen instead as two equal areas separated by a
ertical. In sharpening, the small difference becomes a big and
asily seen difference. The tilt may be seen as more diagonal, and
ne side may be seen as much smaller than it actually is.

So, clarity does not necessarily mean simple or symmetrical shape, but it does mean unambiguous shape. For artists this suggests that, as a critic once said, the middle road is sometimes the only road that doesn't lead to Rome. Clarity can be achieved by more emphasis, by moving toward a more easily visible simplicity or a more easily visible complexity. As we will see again and again, simplicity and clarity together guide us in our search for form, and these two influences can modify one another in surprising ways.

CHAPTER 4
Dynamism

SOME ARTISTS WORK WITH SHAPES AND COLORS THAT MOVE. The sculpture by Mark Di Suvero in figure 4.1 is made of forms delicately balanced on a pivot so that they turn and swing through space. Art that moves, also called *kinetic art,* shows us a continual flow of new combinations, overlappings, size variations, and silhouettes as it changes position.

We can also say that we perceive movement, or *dynamism,* in works in which there is no actual movement at all. In the relief sculpture of a dancing maenad in figure 4.2, it's easy to see what we mean. The carved stone itself does not move, and yet the vitality and rhythm of the dancer is expressed in what we see. The work is full of movement.

Shapes, as we have said, are the visual record of forces in balance. The outward thrusts of the points of a triangle, for instance, convey directed movement.

As the structural skeleton of a shape becomes less symmetrical or balanced, some of its potential seems to be released as one thrust becomes more powerful than the others and gives the shape direction. It is this directed thrust to which we refer when we speak of visual dynamism (fig. 4.3).

Under certain conditions, we can even see an illusion of physical movement in static shapes. When you turn on your television set, the rectangular shape of the screen seems to develop from its center out to the four corners. When you turn it off, the rectangle seems to disappear by shrinking in upon itself to the center along these same directional lines. Other shapes flashed suddenly onto a screen will do the same thing. If a triangle is projected upon our screen, we will see a sudden outward thrusting toward the three corners, and a circle will seem to inflate outwards evenly from its center. If the projector is suddenly turned off, the shape will collapse inward along these structural axes. Psychologists call this illusion *Gamma Motion* (fig. 4.4).

If an irregular shape, such as a triangle with unequal angles, is flashed on a screen, the movement will appear to occur in the

fig. 4.1. Mark Di Suvero, *The A Train.* 1965. Wood and painted steel, 157 × 132 × 115″. Hirshhorn Museum and Sculpture Garden, Smithsonian Institution.

fig. 4.2. Maenad Leaning on Her Thyrsos. Roman copy of Greek work of late fifth century B.C. Relief, Pentellic marble. All rights reserved, The Metropolitan Museum of Art, Fletcher Fund, 193

direction of the strongest axis, that is, in the direction toward which the triangle points. This demonstrates for us that visual movement, or the potential for it, is built into a shape or pattern from the very beginning. Movement in nonkinetic art does not necessarily depend on an accurate description of real motion

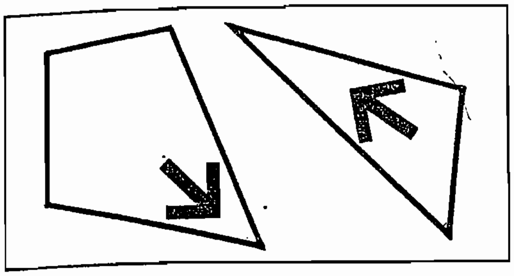


fig. 4.3. Directed tension.

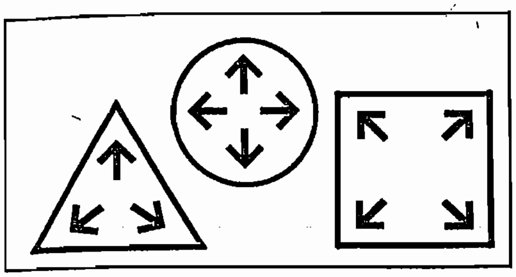


fig. 4.4. Gamma motion.

Certainly in a painting like *Sicilian Chance* by Larry Poons . 4.5), the small ovals move about like a swarm of bees. Each ıl describes its own direction, and many line up to create gonal paths across the picture. Visual movement is created e without any realistic image at all.

Figure 4.6 reproduces some photographs from a series taken Edweard Muybridge, a British photographer who worked in ıerica in the nineteenth century. Muybridge was an early de- oper of stop-action photography. By arranging a number of

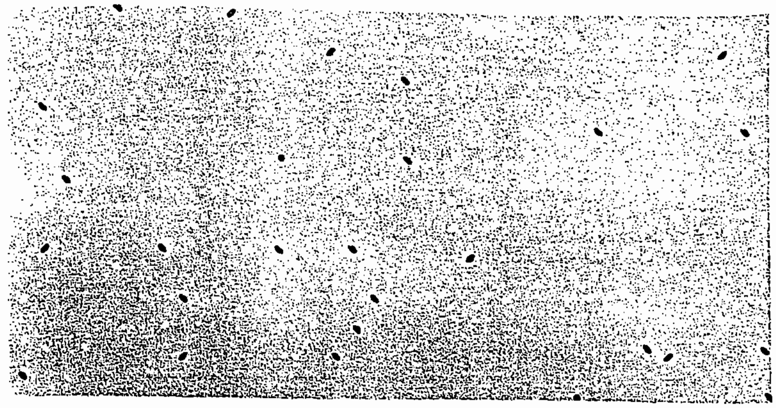


fig. 4.5. Larry Poons, *Sicilian Chance.* 1964. Synthetic polymer on canvas, 72 × 144¼. Hirshhorn Museum and Sculpture Garden, Smithsonian Institution.

cameras to take photos in quick succession, he was able to take a series of pictures showing how the bodies of people and animals actually move. Each still in this series accurately shows a cat stopped in the act of running. Every frame is equally realistic and correct in its depiction of some moment of action, and yet, taken individually, some shots, such as frame 21, feel awkwardly frozen, while others, such as frame 15, convey a lively sense of motion.

Most of us have seen visual contradictions like this at one time or another: a photo of an athlete or dancer who seems to be standing quietly in midair, although the action shown may be a moment in a strenuous leap (fig. 4.7).

In the more frozen looking of the Muybridge photographs, we often notice that the main axes of the animal's body, the torso

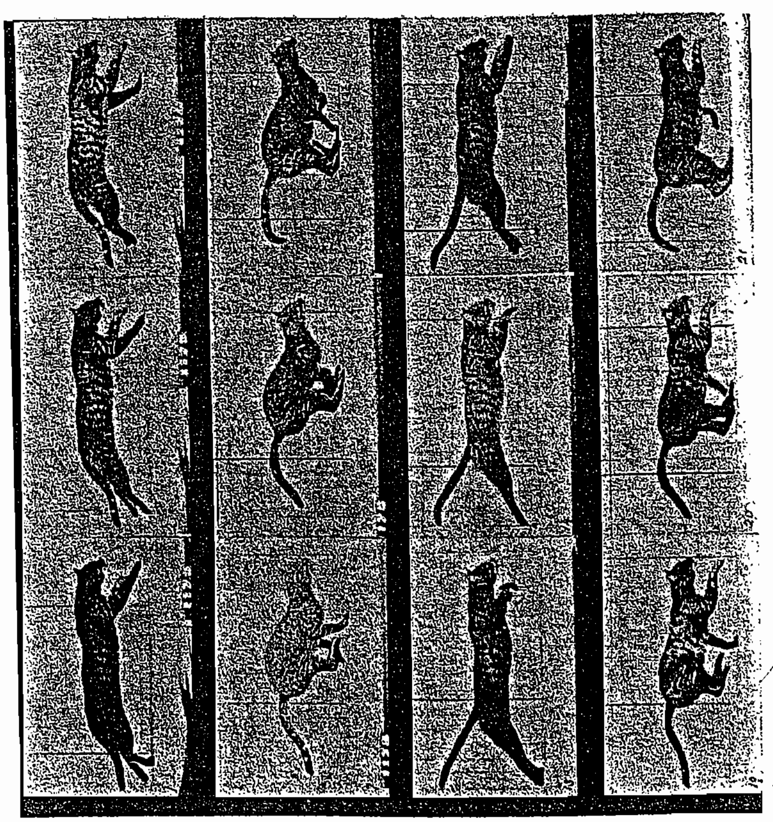


fig. 4.6. Eadweard Muybridge, Cat Galloping, from *Animals in Motion* (New York: Dover Publications, 1957). Photographs originally published in 1887.

fig. 4.7. Stop-action photograph. From Eadweard Muybridge, *The Human Figure in Motion* (New York: Dover Publications, 1955). Photograph originally published in 1887.

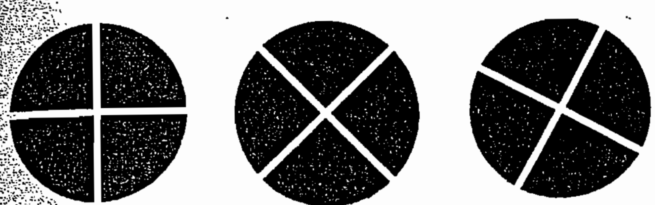
and legs, are nearly vertical and horizontal. Take, for example, the line of the rear legs in frame 20.

Remember that in any visual field, the vertical and horizontal are areas of strong visual magnetism. Just as the dots in the square in figure 3.8 tended to be pulled toward the vertical and horizontal midlines of the structural skeleton, so an arm, leg, or shape which lies on or parallel to these structural landmarks will tend to seem visually stuck there, rather than merely passing through on the way to another position.

This gives us a useful general principle: Whenever the main axes of a form lie on, or nearly on, a vertical or horizontal, the form will seem to be visually at rest. As the main axes become more diagonal we have a stronger sense of movement.

In figure 4.8, each position of the rotating wheel is equally possible. In the first version, stillness is most apparent because of the strict vertical/horizontal alignment of the spokes. The second version is a little more dynamic, but this pattern also feels fairly frozen because the ends of the spokes fall at four points that are vertically above and horizontally across from one another, creating a symmetrical pattern, like the four corners of a square. The spokes are again stuck at these corners. In the third version, the spokes form asymmetrical diagonals, giving the strongest suggestion of movement.

fig. 4.8. Rotating wheel.



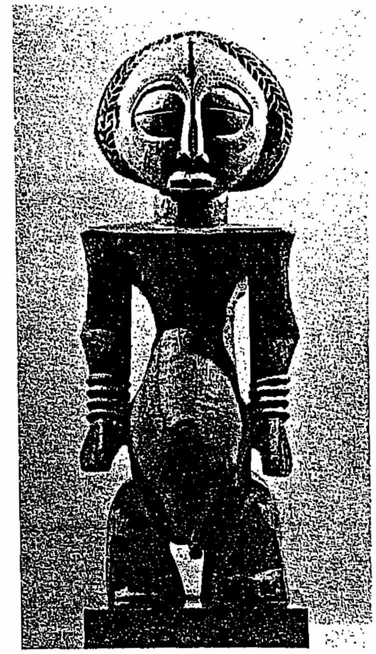


fig. 4.9. Standing Male Figure, Ancestor, Buye tribe, Congo–Kinshasa, Wood, 31¼" high. All rights reserved. The Metropolitan Museum of Art.

The Congolese sculpture shown in figure 4.9 is, when viewed from the front, dominated by vertical and horizontal movements. The result is an image that is intensely, rivetingly still. The terracotta statuettes from Xochipala, Mexico, by contrast, are gently animated by the crisscrossing diagonals of the arms and legs (fig. 4.10). Here the diagonals create a visual equivalent for the kind of human interaction that is part of a lively conversation.

fig. 4.10. Seated Youth and *Seated Shaman.* Mesoamerican, Xochipala, before 1500 B.C. Terracotta, 5⅜ and 4¼" high. The Art Museum, Princeton University. Gifts of Gillett G. Griffin, in Honor of David W. Steadman, 1969.

Another way to generate a feeling of motion is to use a *gradient,* that is, a progressive change, more or less gradual or smooth, in some visual quality. Gradients can involve size, location or distance, texture, value or brightness, or color. We can envision a gradient, for example, as a change in the direction of a line. Imagine a line made by an ice skater moving in a figure-eight pattern, or the gradual swelling and tapering of a three-dimensional form, such as a pear.

Gradients seem to be characteristic of the forms of all living things. We see gradients in the way our own bodies swell and narrow, in the oval shape of a leaf, and in the bulge of a bicep as an arm strains to lift a weight. When we see gradients in nonliving things, such as the smoothly irregular forms of rocks on the seashore, we are struck by how oddly alive a stone can look.

The exaggerated swelling and tapering of the Egyptian clay sculpture of a bird deity in figure 4.11 is a gradient of changing size, an enlivening element which makes the whole form move and breathe.

fig. 4.11. Bird Deity. Egyptian, Early Predynastic Period, c. 4000 B.C. Painted pottery, 11 7/16". The Brooklyn Museum, Museum Collection Fund.

Other kinds of gradients can be applied to a form. The letter forms in figure 4.12 offer some examples. The first letter has the graceful swellings characteristic of letters that were originally drawn with a flat-tipped pen. In the second letter, another, overall gradient that extends from top to bottom creates an even more lively motion, and this is further intensified if we add a third gradient, of light and dark, which produces an in-out movement.

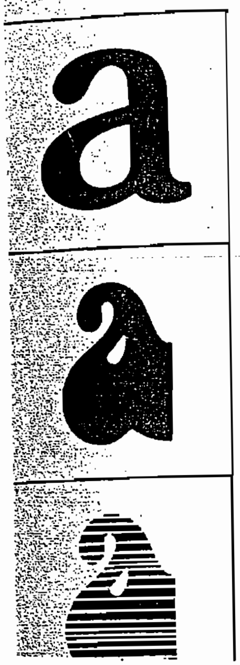


fig. 4.12. Application of gradients to letterforms.

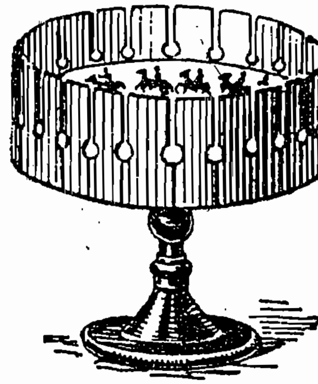


fig. 4.13. Zoetrope.

A dramatic example of a gradient of location can be seen in something we call a stroboscopic illusion. Stroboscopic motion was the basis for the little machine (sometimes called a Zoetrope) used a hundred years ago as a parlour game (fig. 4.13). The Zoetrope created a "moving" picture by quickly flashing a series of still pictures in front of the viewer. This device was a precursor of movies, which are a development of the same principle. Artists have applied a similar idea to static images. When shapes are arranged along a gradient so that they can be seen as the same shape changing position, the effect of motion is very strong. We can see this happening in Marcel Duchamp's painting, *Nude Descending a Staircase* (fig. 4.14).

The difference between visual motion and real motion, between the story we tell as artists and how we tell it, is well illustrated by an episode involving Eadweard Muybridge.

fig. 4.14. Marcel Duchamp, *Nude Descending a Staircase, No. 2.* 1912. Oil on canvas, 58 × 35". Philadelphia Museum of Art, Louise and Walter Arensberg Collection.

Muybridge was involved in settling a popular controversy in San Francisco in 1872. The argument was an old one, about just how a horse moves when it runs. Some people claimed that a galloping horse always had at least one foot on the ground. Others bet that a horse sometimes had all four feet off the ground at once. Muybridge, with his cameras, was asked to make some photos showing separate moments in the motion of a galloping horse and settle the argument for good. The pictures (fig. 4.15) clearly show who won. At times, all four legs are off the ground.

Eventually, Muybridge completed a series of photos showing many successive phases of the action, and these photos showed something else which was not expected by either side of the dispute. It is true that when galloping, a horse lifts all four legs off the ground and also that, as was generally believed, at times a horse extends its legs as far apart as they can go, but at no time do these two things happen together. Such a position is physically impossible except when the horse is leaping over an obstacle.

Yet artists had been making pictures of running horses for thousands of years before the camera was invented, and this "impossible" position was frequently used. Figure 4.16 is a Persian painting from ca. 1330, and in it we can see the same pose used by Henri Toulouse-Lautrec more than five hundred years later (fig. 4.17).

The reason is not difficult to understand. The spread-legged pose, though technically incorrect, conveys the speed of the event in the most heightened way. It translates movement in time and space into a medium in which time and space do not exist.

Motion can be expressed in a still image not only by the use

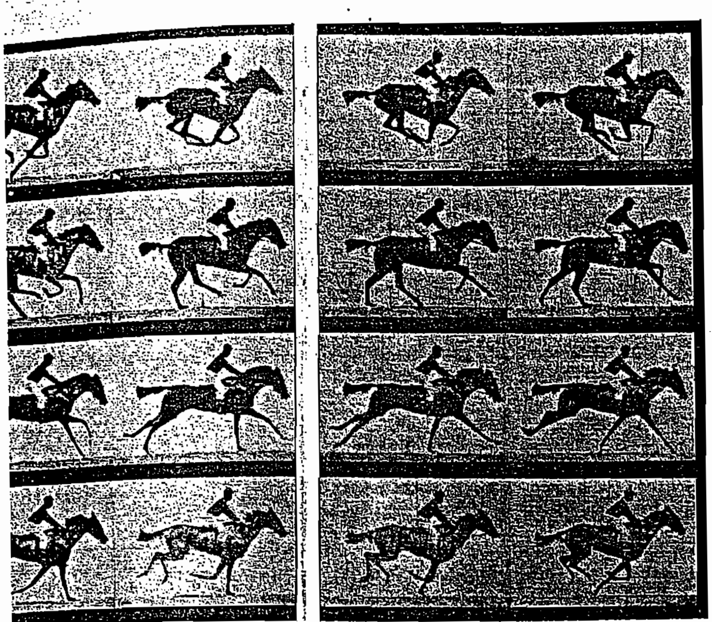


fig. 4.15. Eadweard Muybridge, Horse Galloping, from *Animals in Motion* (New York: Dover Publications, 1957). Photographs originally published in 1887.

fig. 4.16. "Combat Between Rustam and Isfandiar." Leaf from the "Demotte" *Shahnama* (History of the Shahs). Persian, fourteenth century. Colors on paper with silver leaf (darkened). Full leaf: $15\frac{3}{4} \times 11\frac{1}{2}$". The Nelson-Atkins Museum of Art, Kansas City, Missouri (Nelson Fund).

fig. 4.17. Henri de Toulouse-Lautrec, *Le Jockey*. 1899. Color lithograph. National Gallery of Art, Washington. Rosenwald Collection.

of directions or gradients. In the forms of nature, we often see patterns that are full of movement. The curves and bulges of a pepper, the twisting forms of tree roots, the patterns made by water on the sand are all strongly dynamic visual events. Such things show us the motion of their own growth, frozen into form. The biologist C.H. Waddington observed that what we see when we look at an organic form "is only a single still out of a continuous sequence of forms which continuously unfolds, sometimes quickly, sometimes more slowly, throughout the life of the organism of which it is a part."

The pepper in Figure 4.18 shows us how it grew by the way it looks. Its form is the product of its growth movements. A speeded-up film of the pepper growing would show us more changes in its form as it continues to grow.

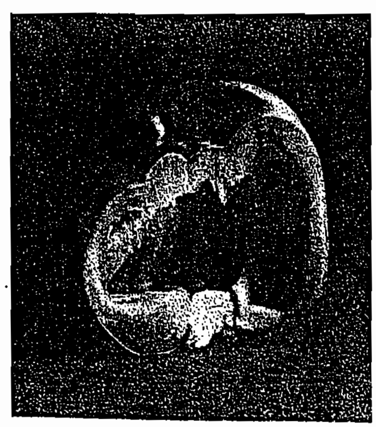


fig. 4.18. Dynamic forms of growth: a pepper.

fig. 4.19. Robert Smithson, *Spiral Jetty*. 1969. Great Salt Lake, Utah (photo by Gianfranco Gorgoni/Contact).

Usually, however, the dynamic forms that we see in a work art were not made in quite the same way. The movement in bert Smithson's huge sculpture *Spiral Jetty* (fig. 4.19) was not eated by the twist of some gigantic hand, but came about ough a careful piecing together, an additive, stone-upon-stone ocess.

Dynamic forms in art and nature are often made by different processes, but sometimes the artist works more like nature does. In some kinds of art, hand, arm, and body movements can create certain kinds of marks or "tracks," which can become important elements in the work. We know, for example, that just by moving a pencil quickly and rhythmically over the paper, we can create dynamic patterns of lines. We do this often when we doodle or when we try out a new pen.

All scribbles are not the same, however. Even when scribbling casually, each of us has a way of making marks that is as personal as our own handwriting. In the work of mature artists, these "handwriting" qualities can be an important part of style.

The loose and almost casual looking scribble that we see in a drawing by Rodin (fig. 4.20), is different in character from the tightly packed tangle of lines that Giacometti uses to describe forms (fig. 4.21). The muscular swelling of Cezanne's line is different from either of these (fig. 4.22).

The emphasis on the quality of the gesture was carried to an expressive extreme in the work of Jackson Pollock. Pollock, perhaps the most famous of the Abstract Expressionist painters, made many of his works by laying a sheet of unstretched canvas on the floor, and then dripping or throwing paint from a loaded brush or stick down onto the canvas (fig. 4.24). Since he often worked on a very large scale, he frequently had to walk right onto the canvas in order to reach the area upon which he wanted to paint.

So for Pollock, the canvas became something like a zone or area that he could exit from and enter into, just as, in rehearsing a play, we might create a stage area to walk in and out of by

fig. 4.20. Auguste Rodin, *Dancing Figure*. 1905. Pencil with orange wash, 12¾ × 9⅞". National Gallery of Art, Washington. Gift of Mrs. John W. Simpson.

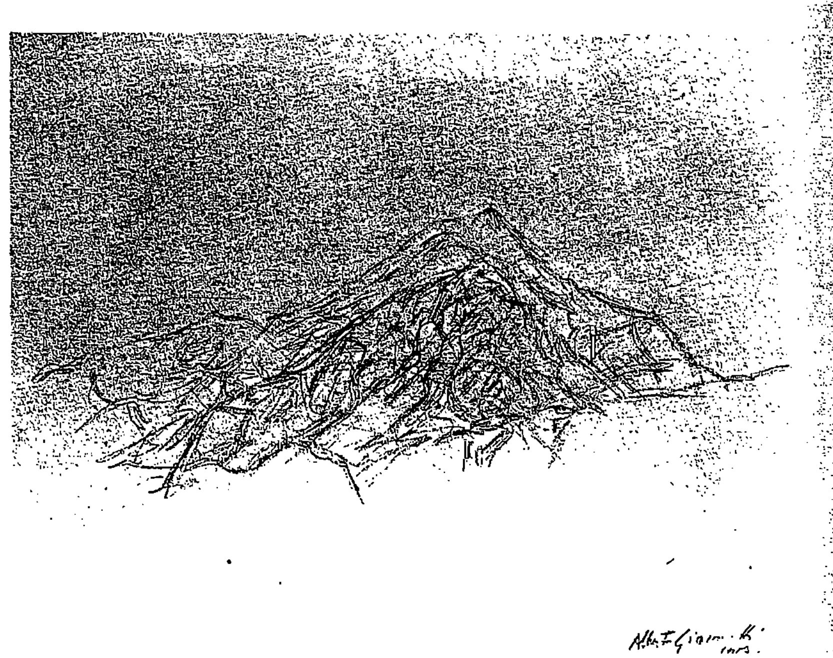


fig. 4.21. Alberto Giacometti, *Mountain*. 1957. Pencil, 19¾ × 25¾". Collection, The Solomon R. Guggenheim Museum, New York (photo by Robert E. Mates).

fig. 4.22. Paul Cezanne, *Study After Houdon's "Ecorche."* Lead pencil on paper, $8\frac{1}{4} \times 10\frac{7}{8}$". All rights reserved, The Metropolitan Museum of Art, Maria DeWitt Jesup Fund, 1951, from the Museum of Modern Art, Lillie P. Bliss Collection.

outlining a large rectangle on the floor with chalk or tape. As Pollock walked through his canvas, bobbing, weaving, and turning like a dancer or a prizefighter, the dripped paint that he left behind became a kind of trail, the evidence of his presence after he was gone from the stage (fig. 4.23). A Pollock painting can be looked at as an accumulation of tracks, a frozen record, on canvas, of the artist's movements (fig. 4.24).

Some artists since Pollock, interested in this aspect of his work, have extended the assumption that the act of painting is a performance on the canvas and have changed the emphasis. For them, the action *itself* became the important thing, rather than the paint-covered canvas, which, from this perspective, could be viewed simply as a leftover. In performance art, the action, moving through space, walking, turning, and defining space with the body, becomes the thing which we observe.

Even artists who do not base their work on a Pollock-like concern with gesture know that practiced hand and arm movements can create a feeling of fluidity in a drawing or design, as we saw in the Rodin sketch. In a drawing class, an instructor will often talk about "loosening up," or using the whole arm, when handling the pencil or charcoal.

In the 1950s and 60s, there was a loosely defined movement called *Abstract Expressionism* or *Action Painting.* Willem de Kooning, himself an action painter, sometimes satirized the concern with the gestural mark and brushwork in pictures in which the paint was applied as thickly as mayonnaise to create strokes of comically heroic size (fig. 4.25).

fig. 4.23. "Jackson Pollock, East Hampton, New York, 1950." From *Fifty-Two Artists—Photographs by Hans Namuth* (Scarsdale, N.Y.: The Committee for Visual Arts, Inc., 1973).

Action Painting was seen by many as something new, a break with tradition, but another much more ancient and continuous tradition, the painting of Japan and China, placed great emphasis on the training of the artist's movements when creating a mark.

The materials of Oriental painting were the tools that had been developed for writing; thin and free-flowing black ink combined with a flexible pointed brush or, at times, an almost equally flexible bamboo pen. These are tools supremely well-suited to picking up the differences in the pressure exerted by the artist's arm. Compare the living pulse of a line drawn with an inked brush with the mechanical regularity (some would say monotony) of a line drawn with a rapidograph (fig. 4.26).

fig. 4.24. Jackson Pollock, *Number 27, 1950.* Oil on canvas, 49 × 106". Collection of the Whitney Museum of American Art, Purchase. (Geoffrey Clements Photography).

ı. 4.25. Willem de Kooning, *Door to the River.* 1960. Oil on canvas, 80 × 70". Collection of the Whitney Museum of American Art; Gift of the iends of the Whitney Museum of American Art (and purchase). eoffrey Clements Photography).

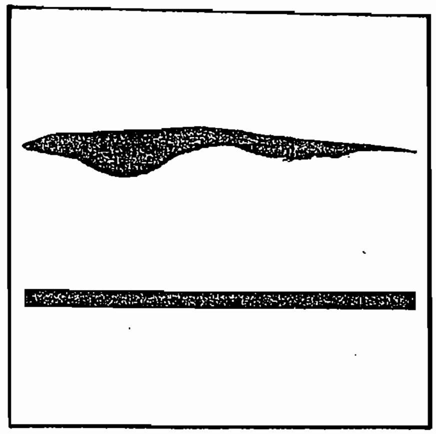


fig. 4.26. Two different line qualities.

The Eastern artist worked on the paper or silk surface as it lay flat on the floor or table, and this meant that the pull of gravity assisted the smooth flow of the ink. Along with a set of materials and methods that register the smallest tremor of the hand with the sensitivity of a seismograph, the Oriental artist was taught to feel the subject in his or her own body, and to practice the movement that would best express the spirit of the subject before touching brush to paper. A gently bending clump of bamboo would call for a similarly delicate movement of the brush across the paper (fig. 4.27). A flock of crows in flight could be made with careful but swiftly darting strokes, which echo in their movement the broken flight of birds, while the gnarled form of an old tree or a broken rock might call for a strong and staccato movement of the wrist (fig. 4.28).

fig. 4.27. Wu Chen, *Bamboo in the Wind.* Hanging scroll, 752 m. × 543 m. Chinese and Japanese Special Fund. Courtesy, Museum of Fine Arts, Boston.

fig. 4.28. Chou Chen or T'ang Yin, *Dreami of Immortality in a Thatched Cottage.* Handscrol ink and colors on paper, 11⅛ × 40 9/16". Courte of the Freer Gallery of Art, Smithsonia Institution, Washington, D.C

Remember that when we speak of movement, we mean nc only the movement of shapes and individual units within th picture, but also compositional movements, the sort of overal flow that seems to sweep up smaller elements and carry then along. It may be easier to impart movement to separate shape than to fit many movements into a coherent whole. If we com pare a drawing by Van Gogh (fig. 4.29) with a poor imitation (fig 4.30), we can see a difference. The imitation may copy Var Gogh's "handwriting," but the overall story is a chaos of lines ir

fig. 4.29. Vincent Van Gogh, *Cypresses.* 1889. Reed pen and ink, $24\frac{1}{2} \times 18\frac{1}{2}$". The Brooklyn Museum, Frank L. Babbott and A. Augustus Healy Funds.

fig. 4.30. "Imitation" Van Gogh.

which one thing bumps into another, rather than the rhythmic choreography of the original.

In a clear composition, angles, directions, and movements are shown in their final placement, with no changes or adjustments needed. The kind of movement, an unsteady wiggle, that is the result of unsure placement is not what concerns us here, rather, it is the much more satisfying movement that conveys the feeling of forces and counterforces resolved and balanced. Th vitality of the Van Gogh comes certainly from the vigor an dynamism of that resolution, but it is also clear, unified, and sure

When considering the struggle to find the appropriate orde for the forms and forces in a composition, we may keep in min what Picasso said of painting in general: "To search means noth ing in painting. To find is the thing."

CHAPTER 5
Figure/Ground and Depth

WE PUT THE THINGS THAT WE SEE INTO A CERTAIN ORDER, and our tendency to seek the simplest organization possible is an underlying influence whenever we arrange e information that our eyes gather.

We can pursue this further by questioning some things that e usually take for granted. When do we see elements as separate? While it is true enough that a man looks different from the rk bench on which he is sitting, and a tree looks different from automobile, all of these items can also be seen as components a continuum, a river of sights, sounds, smells, and other sensans that surround and flow past us, often at a rapid pace. Why ouldn't it all become a blur?

In fact, it sometimes does. Most people have had the experience, at one time or another, of walking down the street or being a crowd while their attention was elsewhere, while they were t in thought.

At such times, when we turn our attention inward, everything around us may become a sort of even buzz. We may fail to see things or hear what people are saying, although our eyes are open and our ears aren't filled with cotton.

But most of the time we do better than that. We focus on individual things and pick them out from their surroundings, and in the picking-out process, we ignore, of course, what we do not pick out. At an elementary level, seeing a thing means fencing off or isolating one part of the visual world from the rest. To see something, we have to rescue it, to segregate it from everything else.

This first step in seeing, distinguishing a thing from its background, is called seeing a figure/ground relationship. In the most general sense, *figure* is the thing that we pick out or focus on, and *ground* means the background from which the thing is picked out.

We can observe this basic discovery in the drawings of children at different stages of their development. Children often begin to draw by scribbling, moving a crayon or pencil rapidly over the paper. In its earliest stages, drawing is simply a form of expressive body movement, like jumping or clapping, and the process is much more important than the tangle of lines produced. Eventually, though, the child realizes that a line can double back and connect with itself to form a closed shape, a circle.

The circle is an important invention for the child, because it closes off one area of the paper from the rest. It creates a thing, separate from the amorphous nothingness of the white page, and thereafter, the child uses it to "pick out" objects, regardless of what they look like. Just as an adult might use circles to indicate the position of cities when drawing a simple map, a child uses them to indicate hands, bodies, cars, or windows; to show "thingness" picked out from the flux of appearances (fig. 5.1).

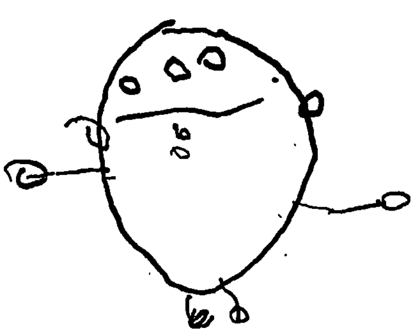


fig. 5.1. Chloe Anne Martinez (age 3), *Figure.*

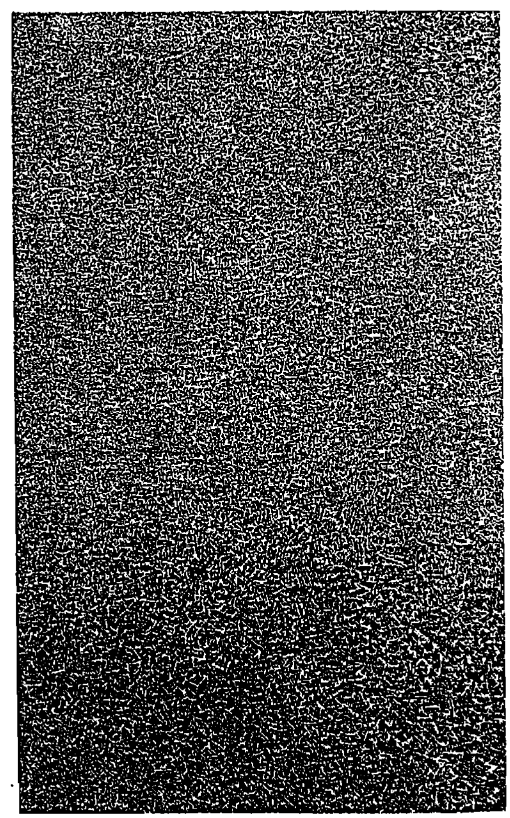


fig. 5.2. Mark Tobey, *White World.* 1969. Oil on canvas, 60 × 36". Hirshhorn Museum and Sculpture Garden, Smithsonian Institution.

The painting by Mark Tobey in figure 5.2 is an example of a work that is all ground. There is no single shape, no figure, that stands out or detaches itself from the rest. The evenly scattered paint marks, all of them of approximately the same size, are interwoven to form a smooth and continuous visual field.

There are visual equivalents to this in nature, things that we see, such as the wash of color in a clear sky at dawn, that give us this overall sensation, an experience that seems all of one piece. We cannot make a meaningful diagram of such a visual event, as we might, for instance, make a diagram of the main shapes and lines of composition in a design full of different shapes and sizes. In the Tobey and in the cloudless sky, there are no separate pieces.

Whenever we perceive a figure/ground relationship on a two-dimensional surface, we inevitably find ourselves confronted with an illusion of depth.

The thirteenth-century Italian painting of a saint on a gold background in figure 5.3 is a good example of a simple figure/ground relationship. We read the saint as being in front of the gold background rather than existing on the same flat layer with it the way the cut-out shapes of a wooden picture-puzzle all fit into a single level. We perceive the gold ground as a single flat surface continuing uninterrupted from one side of the painting to the other, despite its being partly blocked from our view by the saint's body. If we were to draw an imaginary side view of the painting, we might produce something like figure 5.4, with its two flat levels, like the cut-out forms of stage scenery.

fig. 5.3. Master of the Franciscan Crucifixes, *Saint John the Evangelist*. c. 1272. $31\frac{5}{8} \times 12\frac{1}{2}$". National Gallery of Art, Washington. Samuel H. Kress Collection, 1952.

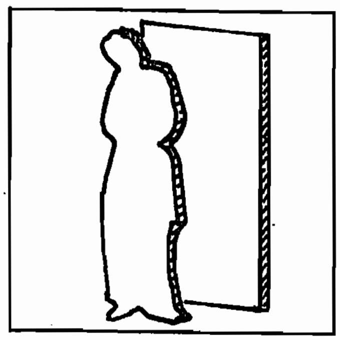


fig. 5.4. Two levels of space.

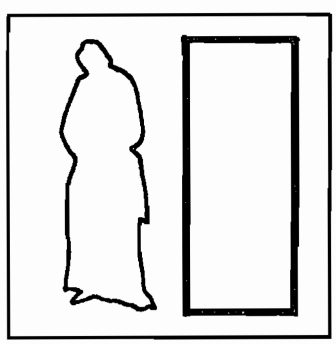


fig. 5.5. Figure and ground.

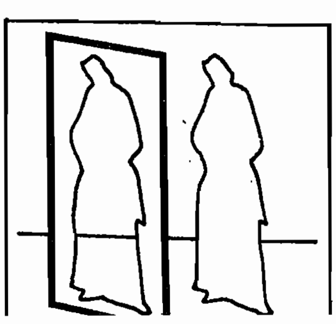


fig. 5.6. A saint-shaped hole.

Here we are using the terms figure/ground in a specific
Figure refers to the thing in front, and *ground* means the
behind. We can substitute the words foreground and backgr
or say one thing in front of another, and we will have just
the same meaning.

But why should we see levels of depth at all? Touch the
if you need to verify that there is only one flat surface on v
the shapes lie. Why should an illusion of depth appear?

Once again, the Simplicity Principle offers an explana
As we have already seen, if a simpler visual structure is obt
by perceiving depth, then a depth illusion will occur. Her
means that, seen as one level plane, a flat picture puzzle
Italian painting is made of two basic shapes, each with a
complicated outline. The version in depth gives us a sir
answer; one complicated shape and one simple one (fig.
For the same reason, we do not see the saint existing on a
in back of the gold layer, viewed, as it were, through a
shaped opening in a gold screen (fig. 5.6).

The figure/ground relationship affects our perception ir
tle ways in visual situations where we seldom think about t
dimensional illusions at all. On a page of type we see the l
forms as sitting in front of the surface of the page. If we
visualize the type as existing in the same layer as the white p
we have to see both the letters themselves, with their co
cated silhouettes, and a page full of intricately shaped e
niches into which the letters can fit, like so many cooki
cookie molds. The simpler version is, once again, a scre
type with an uninterrupted flat white plane behind it.

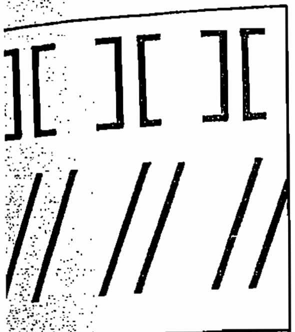


fig. 5.7. Figure/ground: proximity.

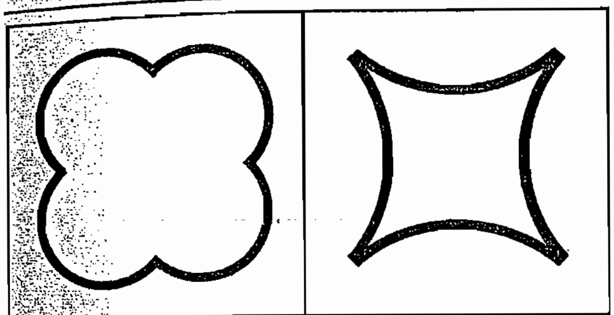


fig. 5.8. Figure/ground: concavity and convexity.

The figure/ground relationship in works of art is usually more complex than the simple two-layer arrangement we have been looking at, and even a painting on a gold ground might be more complicated than we may have thought at first. There are some simple strategies to make one shape function as figure and another function as ground, and by understanding these we can control the figure/ground relationship.

Lines that are placed close together will tend to create figures. Placed further apart, they tend to make shapes that become ground (fig. 5.7). A shape made of convex, outward swelling lines will also tend to look like a figure, while a shape made of concave lines will appear as a hole in the surface of the page (fig. 5.8). Texture, when applied to an area, will make that area read as figure (fig. 5.9).

These effects can be combined so that irresistably clear situations are created: Small, convex shapes filled with texture seen against a larger untextured field (fig. 5.10). This is what happens in the picture of the Italian saint.

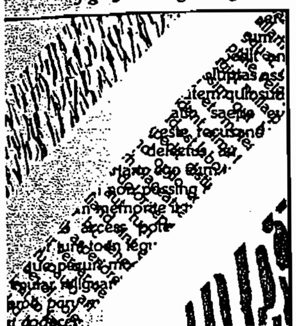
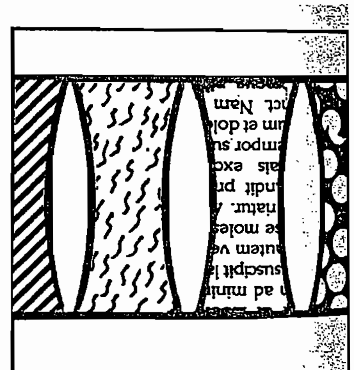


fig. 5.9. Figure/ground: texture.

fig. 5.10. Figure/ground: combining elements.

fig. 5.11. Edouard Vuillard, *The Suitor.* 1893. Oil on millboard panel, 12½ × 14$\frac{5}{16}$″. Smith College Museum of Art, Northampton, Massachusetts. Purchased 1938.

fig. 5.12. Figure/ground: ambiguity.



Elements can be combined so that a figure shape can be made to read as ground. In Edouard Vuillard's *The Suitor* (fig. 5.11), the small, concave, untextured silhouette of the jacket at the center is made to look like a negative shape by contrast with the larger textured areas that surround it, creating a quiet hollow in the active surface of the picture.

Elements may also be balanced so that an ambiguous reading results. In figure 5.12, closely grouped, convex lines form a series of long, almond-shaped figures, but the texture applied to the larger concave areas gives them a competing figure quality also.

Such ambiguity may be an exciting element in a picture. In the collage by Robert Reed (fig. 5.13), different areas can be read in different ways as different textures and shapes come up against one another, creating a tightly layered space.

Matisse's simple but evocative *Venus* (fig. 5.14) was made by glueing blue cut-paper shapes onto a white canvas. The blue areas are full of concavities which make them look like ground, or negative shapes, while the areas between them (the actual negative shapes) swell outward to form the torso. At the same time, both darker shapes are lively looking individuals. The

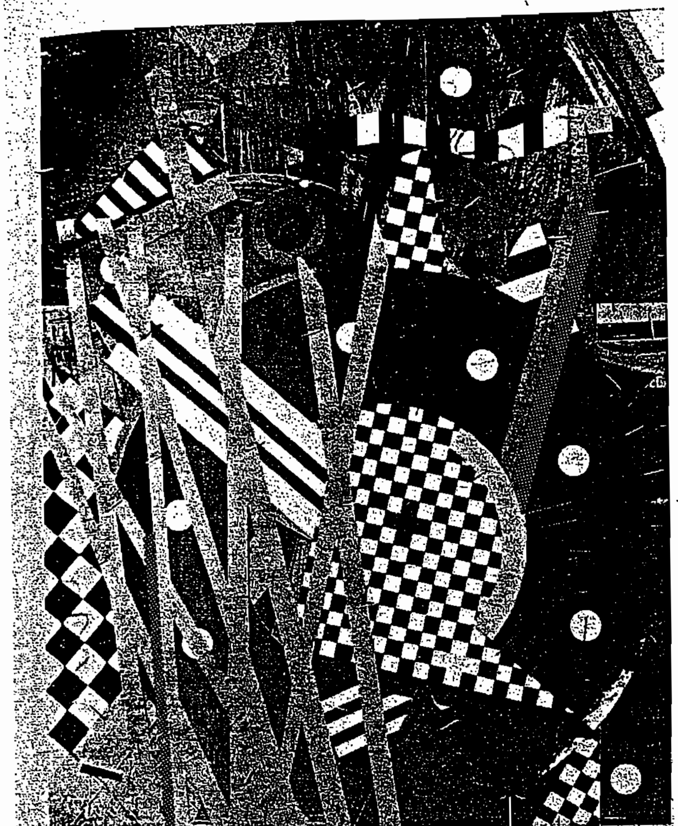


fig. 5.13. Robert Reed, *San Romano Series #3.* 1981. Collage, mixed media, 10 × 13". Collection, Mr. Martin Lipman.

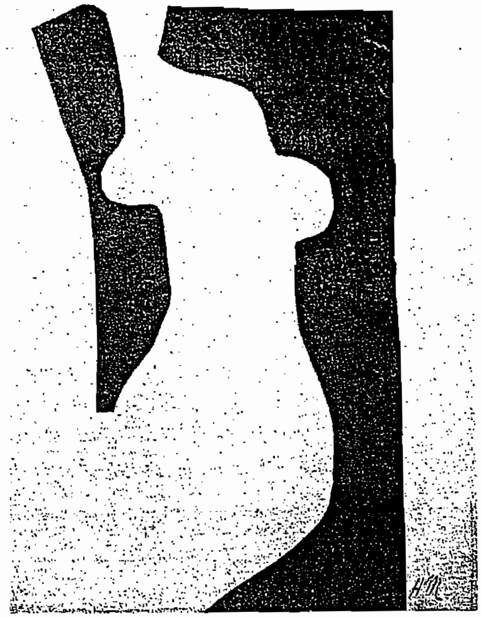


fig. 5.14. Henri Matisse, *Venus.* 1952. Paper on canvas (collage), 39⅞ × 30⅛". National Gallery of Art, Washington. Ailsa Mellon Bruce Fund, 1973.

smaller, more compact one seems nearly to become a positive form, a wiggly, hourglass silhouette. The brightness and resonance of the blue also tends to come forward in space.

As we begin to realize that background can spontaneously become foreground, that the empty spaces in a design can read as full, or positive shapes, we can understand why all the shapes

or areas of a design need to be given careful attention. They may not, after all, be so empty.

Artists working with letter forms need to be aware that most letters are full of such empty spaces. Many letters contain bigger negative than positive spaces, and the beauty of letters, singly and in groups, often depends on how carefully their negative spaces are made. This means treating the ground shapes not merely as leftovers or visual waste material created as the result of adjusting the positive shapes. The ground shapes need to be given enough figure quality so that they can offer some visual competition to the figure. If they compete so strongly that they become equal, confusion results, but if they have an identity that is strong while clearly subordinate to the figure shapes, then we can see the entire surface as a tense and rich play between figure and ground (fig. 5.15).

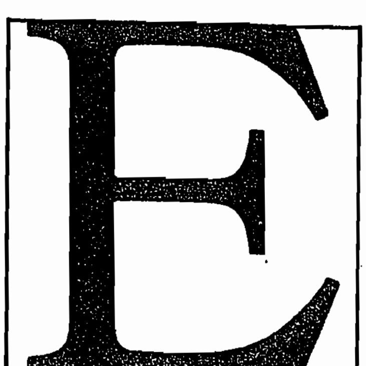


fig. 5.15. Figure/ground: letterforms.

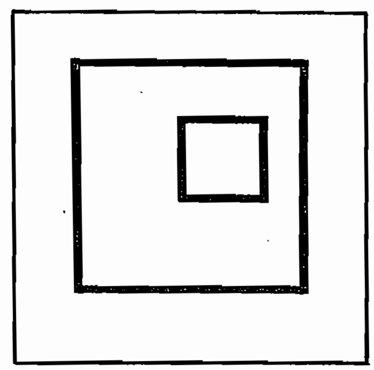


fig. 5.16. Stability of ground.

The relationship of figure to ground has another aspect. We tend to see the ground as the thing that frames the figure. The ground is an environment for the figure. We could say that ground is to figure as a room is to its contents. If we roll a ball across a room, we do not see the room shifting around a stationary ball. It is the ball that moves and the room that stands still.

In the same way, the ground is visually the more stable element, and the figure is the form that wants to wander. We can see this clearly in figure 5.16, in which the smaller square appears to wander, and the larger, containing square seems fixed.

All of the examples of depth that we have examined so far have involved a very simple kind of space: one level overlapping another. Overlapping, a very elementary way of creating space, is also a powerful one, and an important tool in some very sophisticated kinds of art.

fig. 5.17. Edgar Degas, *The Tub.* 1886. Pastel, 23½ × 32⅝". The Louvre, Paris.

In the pastel by Edgar Degas (fig. 5.17), a visual "cliff" is ·med by the sudden shift from a table top in the foreground wn to the figure in the tub on the floor. This deep space is ıde much more noticeable by the way the handle of the hair-ısh and the small pitcher overlap the background space. Mask t these two small details with your finger, and the three-dimen-ınal effect in the picture becomes much weaker, as foreground d background "stick together."

When a space is constricted or small, overlapping can create a generosity of space, a feeling of visual breathing room in a situation that might otherwise seem claustrophobic. Overlapping allows the eye to read its way through space even when there are no other spatial cues. In the painting by Fernand Léger in figure 5.18, a shallow but distinct space is created by overlapping.

Differences in color and differences in light and dark will also create space, even where overlapping is not used. In general, the greater the contrast of color or value between figure and ground, the deeper the space between them will appear to be.

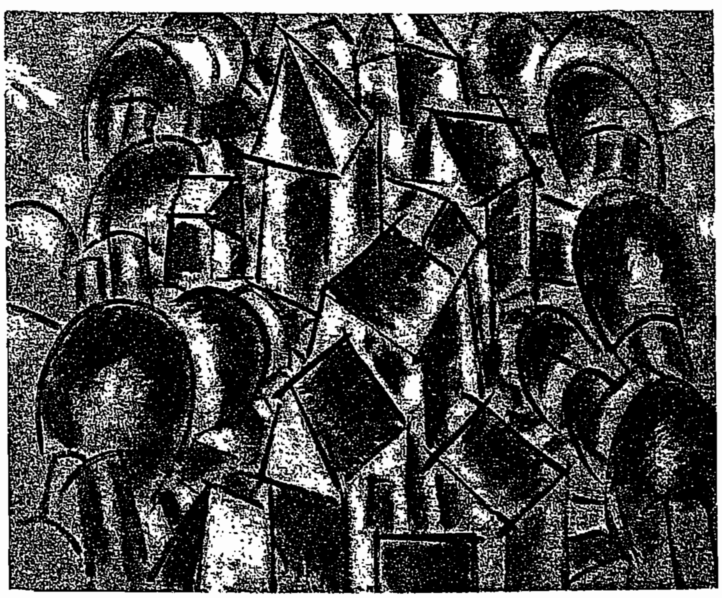


fig. 5.18. Fernand Léger, *Village in the Forest.* 1914. Oil on canvas, 29 × 36¼". Albright-Knox Art Gallery, Buffalo, New York. Gift of A. Conger Goodyear.

The paragraphs of type from the editon of Rafael Alberti's "A La Pintura," designed and illustrated by Robert Motherwell (fig. 5.19) are printed in different color values. The lighter type recedes into the page and the darker type comes forward, evoking an airy space that can be read in and out as well as from side to side and top to bottom. The images that Motherwell created for the text also move into and out of the page in a parallel harmony.

Another way of creating a spatial illusion is through the use of a gradient. We have said that a gradient is a gradual increase, decrease, or change in some visual quality. A space-making gradient might be a gradual change in size, texture, brightness, or direction (fig. 5.20).

The feeling of vast space receding into the distance in the Van Gogh landscape in figure 5.21 is created in large part by a gradient of texture, a progression from larger to smaller, and more thickly applied pen marks.

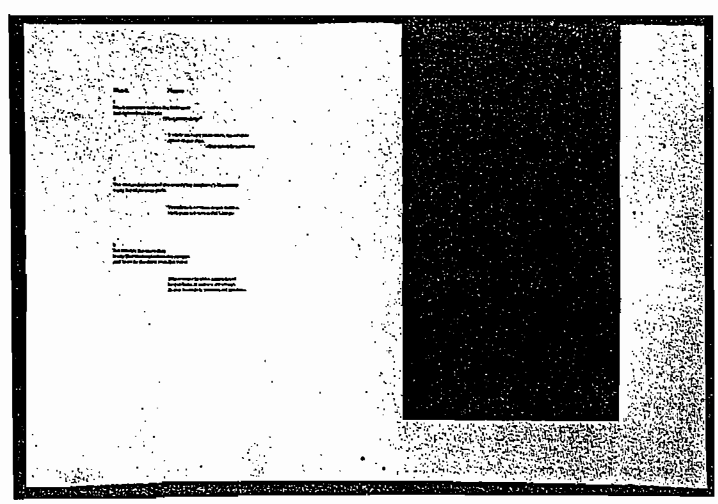


fig. 5.19. Robert Motherwell, "Black" 1–3, from *A La Pintura.* Letterpress, etching, aquatint, 22½ × 12¼". All rights reserved, The Metropolitan Museum of Art. Gift of D. Joseph I. Singer 1972.

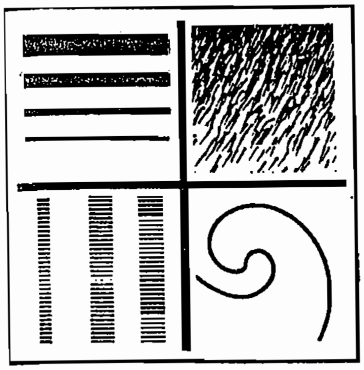


fig. 5.20. Gradients of size, texture, brightness, direction.

The ability of gradients to create an illusion of space comes about, again, in the eye/mind's search for a simpler structure. If we can see the squares in figure 5.22 as being of equal size, we have a simpler visual situation than we would have if we saw four different sized squares. Seeing them ranged in depth is a restructuring that solves the problem; we see shapes of equal size placed at different distances from us.

For a gradient to effectively create a smooth illusion of depth, there must be enough steps and they must have fairly

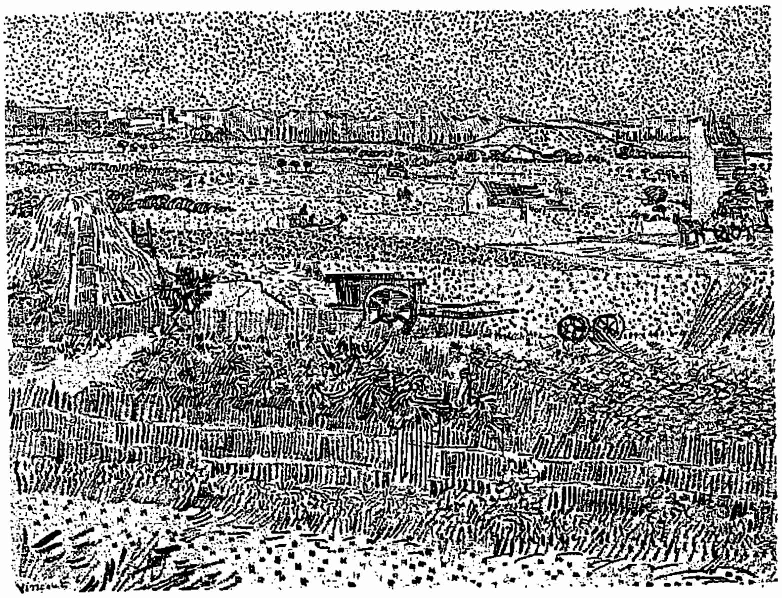


fig. 5.21. Vincent Van Gogh, *Harvest—The Plain of La Crau, Arles.* June 1888. Reed pen and ink 9½ × 12½". From the Collection of Mr. and Mrs. Paul Mellon, Upperville, Va.

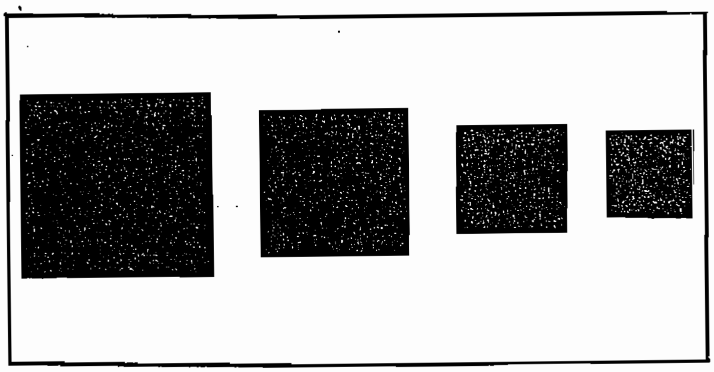


fig. 5.22. Gradients creating space.

equal intervals between them, just as a stairway needs enough equal-sized steps to get you from one floor to the next without jumping or stumbling. In figure 5.23, the feeling of space is not strong. We are likely to see a large square standing next to a tiny square, rather than a nearby shape and a distant one.

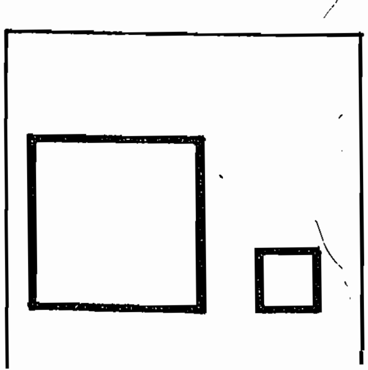
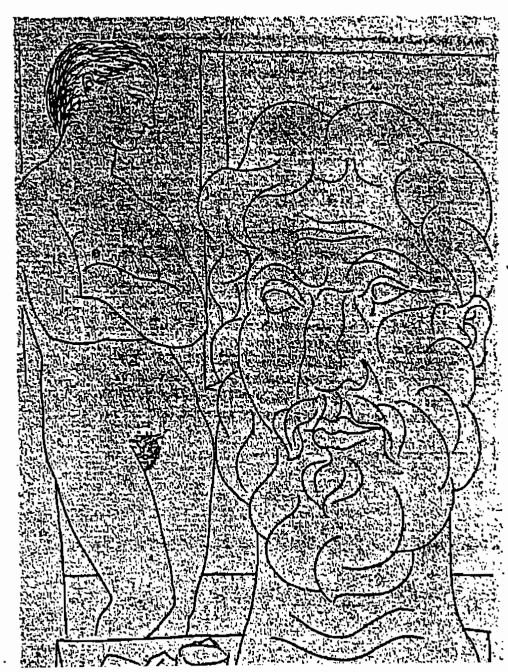


fig. 5.23. Incomplete gradient.

With your finger, mask out the bottom inch of the Picas
etching in figure 5.24. By doing this we eliminate several cruc
overlaps and several steps in the gradient from near to far. T
sense of distance is destroyed. Rather than seeing depth, we se
small figure standing next to a gigantic head.

fig. 5.24. Pablo Picasso, *Model and Large Sculptured Head.* April 1, 1933. Etching, printed in black, 10½ × 7⅞". Collection, The Museum of Modern Art, New York, Purchase Fund.

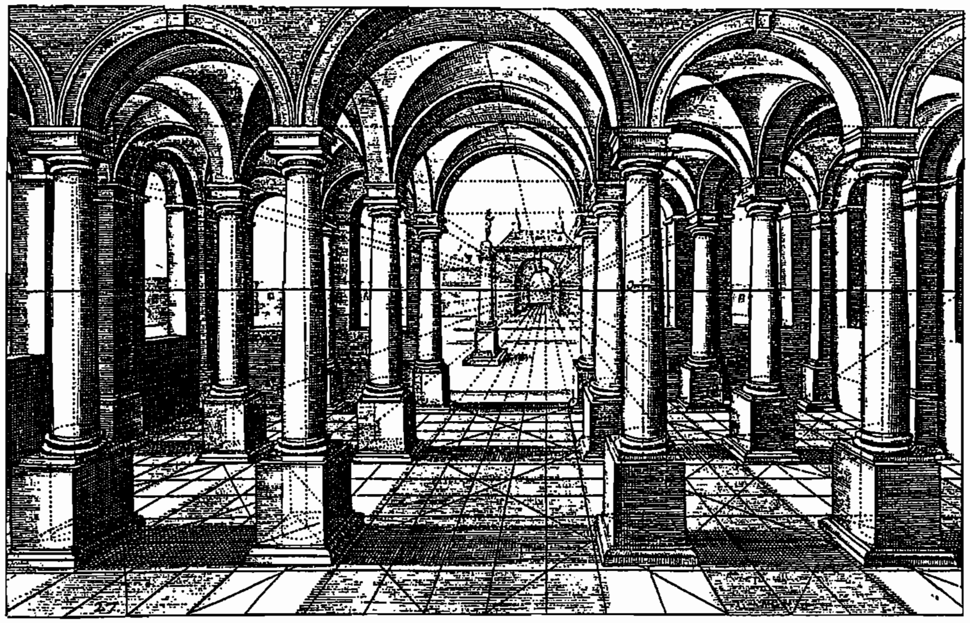


One of the most familiar ways of creating an illusion of :pth is through the use of perspective. Single point, or vanishing)int, perspective is an invention, a set of rules for creating a :pth illusion by drawing lines, and many people think that this quite simply "the way we see."

Single point perspective, as developed in the Renaissance, is ıly one of a number of perspective systems commonly used in 'o-dimensional images, and by knowing a little bit about how e game can be played, we can grasp just how brilliantly ar-icial perspective is.

Perspective systems themselves contain meanings and biases which are built in and not easy to see at first glance. Perspective is less neutral, and less natural, than it sometimes seems to be.

One of the first things we can see in single point perspective is that it can create a strong "funneling" feeling in a picture. In a perspective drawing, everything seems to be sucked in toward the vanishing point on the horizon, or, seen another way, everything seems to be part of a space that shoots toward the viewer like a freight train barreling forward (fig. 5.25). This visual tunnel



. *5.25.* Jan Vredeman de Vries, from *Perspective.* 1604–5. Engraving.

is something that we very rarely experience as we walk down the street. It is true that if we stand still in the middle of a road or some railroad tracks and stare at one point we will see something like this, but this would not be typical of the way we see.

Most of the time, as we go along through our environment, our eyes are at the hub of a moving wheel of vision. As we walk along, we turn our heads to scan the visual world, constantly looking outward and around, back and forth, up and down. Rather than having one vision, like Albrecht Dürer's perspectivist in figure 5.26, with his eye fixed at one viewing point, we have many, each one connected to our eyes like the spokes of a wheel.

The contemporary painter Rackstraw Downes has made this fact an important feature of his work. His *The View from Morningside Heights* (fig. 5.27) effectively conveys something of the experience of turning one's head to scan the landscape.

The basic rule of single point perspective is that lines that in nature are parallel (like the two rails of a railroad track) meet in

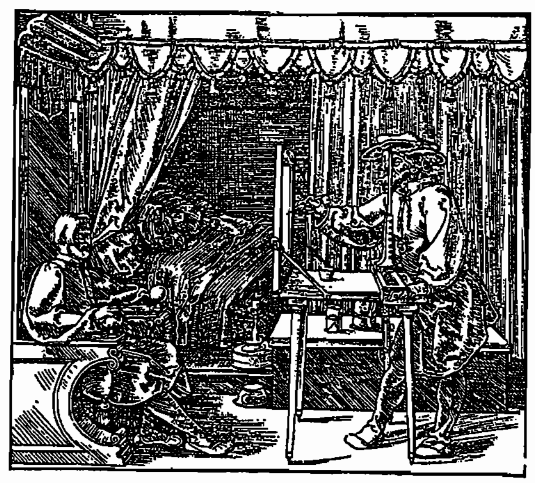


fig. 5.26. Albrecht Durer, "Draughtsman of the Sitting Man," from *A Course in the Art of Measurement with Compass and Ruler.* 1527. Woodcut engraving, 13 × 14.8 cm. Courtesy of the Library of Congress, Washington, D.C. Lessing J. Rosenwald Collection.

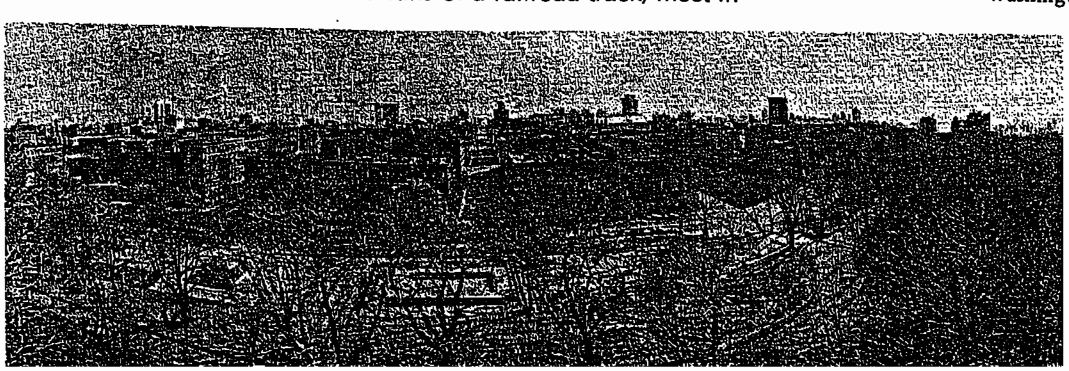


fig. 5.27. Rackstraw Downes, *The View from Morningside Heights.* 1977. Oil on canvas, 16¼ × 46½". Private collection, courtesy of Kornblee Gallery, New York (photo by Robert Brooks).

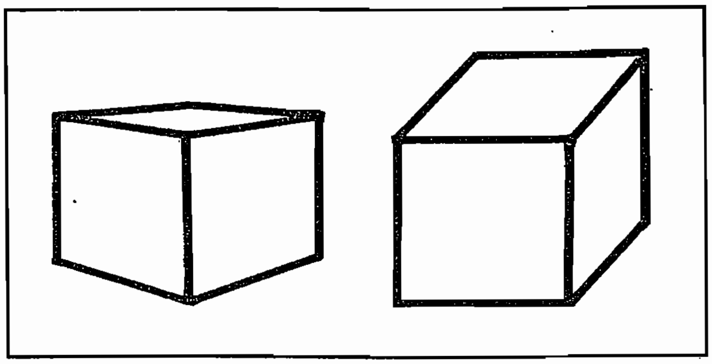
the drawing at a single vanishing point. This is the kind of perspective with which we, as Westerners, are most familiar.

The advantages of such a system are many and well known. Vanishing point perspective gives us a set of fairly clear rules, which tell us how to draw objects closer to and more distant from us. It clearly relates every form in the picture to a single viewing point, creating a strongly unified space that can contain many different visual events and, like a checkerboard, it allows the eye to travel in an orderly, step-by-step fashion through the space.

There is another perspective system, sometimes called isometric perspective, in which parallel lines in nature are kept strictly parallel in the drawing, and never meet.

Figure 5.28 shows a cube drawn in both vanishing point and isometric perspective. Both describe the three-dimensionality of the cube, but in very different ways.

fig. 5.28. Vanishing point and isometric perspectives.



Isometric perspective has often been used in Oriental art (fig. 5.29) and is typically the technique for making architectural renderings of buildings. It too has some very special advantages for certain tasks.

Using isometric perspective, an architect can draw a building three-dimensionally and with much less real distortion than vanishing point perspective would require. For a builder who wants to know just what the shapes and sizes of the rooms depicted really are, isometric perspective can convey such information, where vanishing point perspective would create large rooms in the foreground and smaller rooms in the background (fig. 5.30). Isometric perspective can, then, more nearly preserve the shape of the object as it exists, rather than as it appears, in the world outside the picture surface.

The space of isometric perspective also has a characteristic feeling. Just as vanishing point perspective creates a funnel pulling the viewer into the picture space, in isometric perspective, forms seem to flow sideways, into and out of the frame of the picture, passing before the viewer in a zigzag movement. It is a perspective that creates an infinite space that is always at the same distance from the viewer, a space without a vanishing point (fig. 5.31).

It is important to remember that any kind of perspective space works on our imagination, rather than simply tricking the eye as trompe l'oeil (French for "fool the eye") does. Leonardo's *Last Supper,* for example, is painted on one short wall of a long rectangular room (fig. 5.32). The perspective is designed so that the space of the picture looks like a continuation of the space of

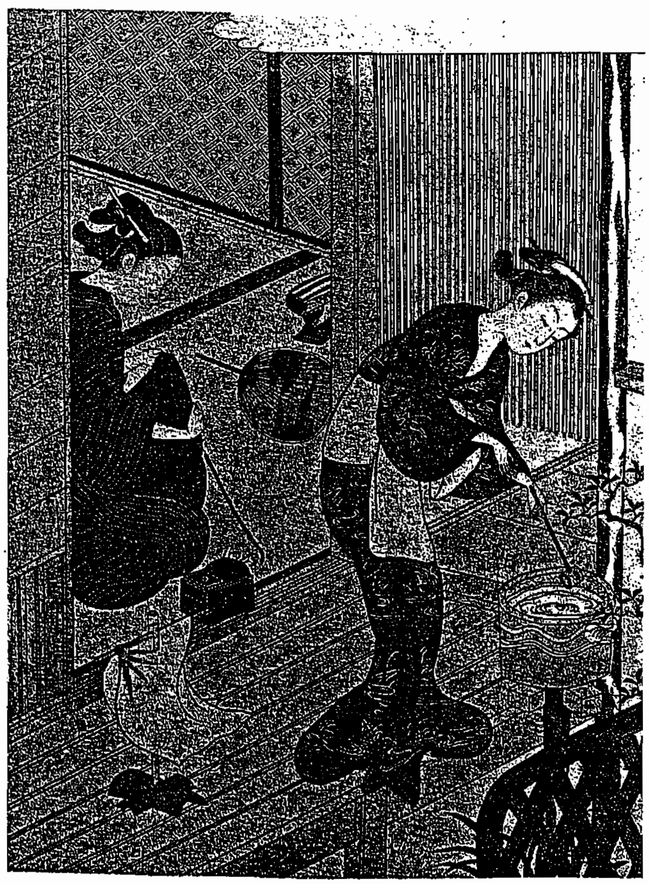


fig. 5.29. Harunobu, *Tenugui Kake Kehan.* Japanese print. Courtesy of the Art Institute of Chicago. Clarence Buckingham Collection.

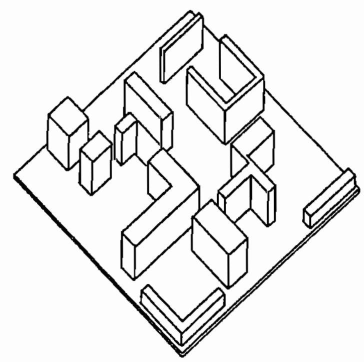
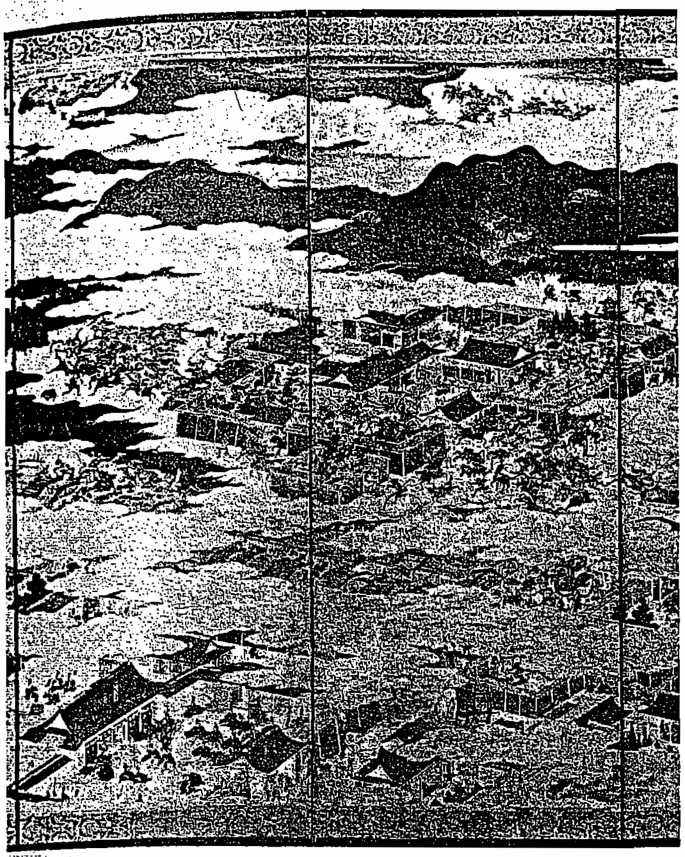


fig. 5.30. Isometric perspective.

the room, but the painting is located some seven or eight feet up on the wall, high enough over the viewer's head to make it obvious that no one is supposed to think of walking into the painting. Still, the perspective invites us to imagine that we can be "in" the picture. This desire to be enveloped and surrounded by the work of art is an imaginative way of experiencing the work more intensely.

We've seen how, in our own century, Jackson Pollock continued and extended this way of thinking about art by literally standing on and inside his paintings as he worked on them (see fig. 4.23).

In the Japanese screen reproduced in figure 5.29, the perspective, rather than connecting the viewer's world with the painted world, keeps the viewer out of the picture. There is a distinct feeling here of floating above and outside of the scene. The viewer, like an omnipresent god, can see and be everywhere at once, but experiences the scene on a different plane than the figures that inhabit it.



ig. 5.31. Japanese screen, *Battle Between the Genji and the Heike.* Detail.

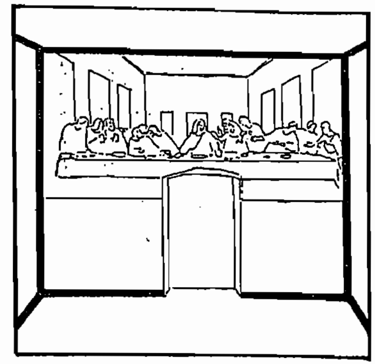


fig. 5.32. Leonardo's *Last Supper* in context.

The isometric system was often used within a format well suited to it, the Oriental picture scroll. The scroll, which was unrolled horizontally and viewed as a continuous sideways movement, provided a perfect context for isometric perspective.

The illusion of space is simply an interesting phenomenon until we understand how it dovetails with our other concerns in two-dimensional images. We shall see that as we dig deeper and deeper into the picture surface we also approach another theme: the need to balance our concern for the three-dimensional illusion with a careful look at the spatial rules of the two-dimensional surface.