How to Read a Painting

By visual paradoxes the artist shocks the viewer into the realization that there is more to art than meets the eye.

By E. H. GOMBRICH

Ernst Hans Gombrich, director of the Warburg Institute of the University of London and professor of the classical tradition there, was born in Vienna, which he left in 1936 under the shadow of the Nazi terror. Professor Gombrich has written extensively on the history and theory of art. His latest book, published in this country by Pantheon Books, Inc., is *Art and Illusion*, which he originally delivered as the A. W. Mellon Lecturer in Fine Arts at the National Gallery in Washington in 1956. Professor Gombrich, who has taught also at Oxford, Harvard and Oberlin, gave the 1961 Spencer Trask Lectures at Princeton University.

None of Molière's immortal witticisms is surer to get a laugh from a modern audience than the surprise of his *Bourgeois Gentilhomme* when he is told that he has been "talking prose" all his life. But was poor M. Jourdain all that silly? What he had discovered in his frantic efforts to climb into the class of noblemen was, of course, not prose, but verse. The notion of prose as a special kind of speech could never have been thought of without the poet's truly surprising ways with language, so well described by the author of Alice in Wonderland:

> *For first you write a sentence,*
> *And then you chop it small;*
> *Then mix the bits, and sort them out*
> *Just as they chance to fall:*
> *The order of the phrases makes*
> *No difference at all.*

The corresponding ways with images practiced by twentieth-century artists have turned us all into M. Jourdains. They have shocked us into a fresh awareness of the prose of pictorial representation.

If we had told an art lover of former days that a picture needed deciphering, he would have thought of symbols and emblems with some cryptic "hieroglyphic" content. Take the

Fig. 1. *Still Life.*
Jan Simonsz Torrentius, seventeenth century.

those tactile values we need for recognition and participation in his world? If so, where should he stop? It is not only touch that gives us information. It is movement, looking at objects from several sides. Without such movement we would never learn to sort out the impressions received by our eyes.

So the debate went on, and representation became self-conscious. The cubist revolution some fifty years ago established the painter's right to present his own commentaries to the conundrum of vision. Instead of tracing the image of a camera obscura, the artist superimposes and telescopes fragments of representations which follow a mysterious order of
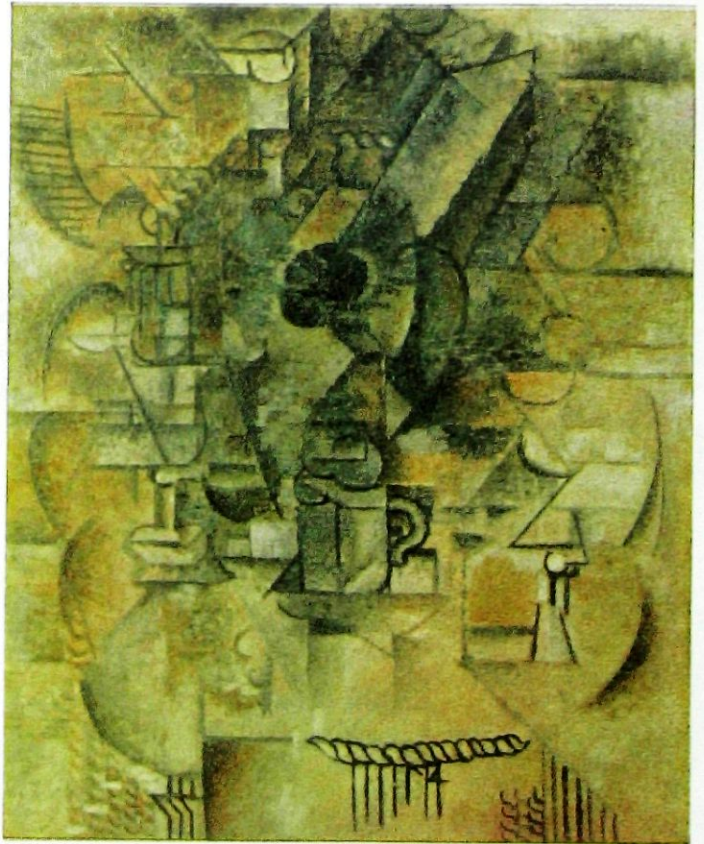
still life by the Dutch seventeenth-century painter Torrentius (Fig. 1). It seems clear enough as a representation, and for good reasons: We know that the artist used an optical device, the camera obscura, to project the image of the motifs onto the canvas where he traced it as one might trace a projected photograph. What wonder that it seemed just as easy to recognize the objects in the picture as it would be to recognize them on the table. If deciphering came in at all, it applied to a second level of meaning, as it were—to the question of what these objects might signify. To the learned *gentilhomme* they would suggest more than a jug, a glass and a yoke, for he would recognize in this curious assemblage the emblems or "attributes" of the personification of Temperance, a lady with the laudable habit of pouring water into her wine and a corresponding disposition meekly to accept the bridle and the yoke.

It was only when learned allusions of this kind went out of fashion, and when everybody could reproduce the image of objects by means of his own photographic camera, that artists began to question the simple assumptions underlying the still-life painter's craft. No sooner had they done so than the public questioned their competence. What impudence of the impressionists to demand of us to decipher their blots and splashes! But this is easy, retorted the painter's champions. Just step back and half-close your eyes, and the blots will fall into place. The magic worked, and the outcry subsided. What remained was the conviction that the artist knew more about seeing than the layman. Surprising as it may sound, the blots must be all we really see of a motif on the table. If we recognize things more easily in life than on impressionist pictures, it is because we can touch and handle objects and thus acquire knowledge of properties which we have no right to ask the artist to paint.

No right? Why not? Should we not demand of the artist precisely for this reason that he must somehow include in his pictures that indispensable information gained from touch,

Fig. 2. *Still Life.* Pablo Picasso, 1911.

their own (Fig. 2). No longer will a simple trick suffice to recover the object on the table. Like the ghost of Hamlet's father, "It is here, it is there, it is gone."

There were and still are critics who claim that this tantalizing method represents some higher order of reality than does the photographic picture. It may well be that Picasso and Braque, who invented the style, were inspired by echoes of similar mystic beliefs. But the continent they found on their voyage of discovery was not the never-never land of the fourth dimension, but the fascinating reality of visual ambiguity. We are in danger of missing this fascination through sheer familiarity with cubist methods which have long since penetrated into commercial art. The shock has worn off, and we no longer attempt to decipher the images that play hide-and-seek among the facets of ambiguous patterns. And thus we are apt to miss the real problem posed by the first of the "modern" styles that broke resolutely with the "photographic" rendering of

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reality: How should each individual form be read? How are the shapes related to each other? Where is the key to the code?

For first you paint an object,
And then you chop it small:
Then mix the bits, and sort them out
Just as they chance to fall:
The order of the aspects makes
No difference at all.

This strange and fascinating way of jumbling the elements of representation is perhaps a novel kind of verse that makes us aware of the existence of prose. For how are the elements ordered in natural- istic pictures, that we should find it so easy, by contrast, to read into them images of tangible things? The formulation may cause some shaking of heads. Surely we do not read the shape of a jug and a glass *into* the Dutch still life; we simply recog- nize it. Of course we do, but where ex- actly is the borderline here between read- ing into and reading? We are all familiar with the clouds, rocks or ink blots into which the fanciful can read pictures of monsters or masks. Some vague similarity to a face or body engages our attention, and we proceed to project the remainder into the welter of forms searching for features that fit in with the first idea.

Psychologists and psychiatrists have become interested in this game of the imagination, and ink-blot-reading tests, such as the Rorschach, are supposed to tell them much of the working of a per- son's mind. They are interested, in other words, in the different interpretations that are given of the same blot. It is these dif- ferences we have in mind when we speak of "reading in." Where all normal people see the same image, we call it reading. We all read the jug correctly because it looks like a jug. But this simple formula- tion begs a good many questions which hide the mystery of reading from us.

We come a little closer to its core with some of the trick pictures in which sur- realist artists conjured up the ambiguities of dreams. Tchelitchew, for instance, turns a tree into the image of a hand growing out of a foot (Fig. 3). He guides our projection by assimilating the shape

Fig. 3. *Tree Into Hand and Foot.*
Pavel Tchelitchew, 1939.

of the tree to other recognizable forms. But such visual punning is still compara- tively simple. For here (not in his other pictures) the artist has taken care that we should know where to look for the mean- ing. We cannot always take this for granted. Indeed, our tendency to jump to conclusions here has been used by the devisers of puzzle pictures and even by

Fig. 4. Royalist print from the French Revolution, *circa* 1793.

propagandists to catch us off our guard. Figure 4 looks for all the world like the representation of a classic urn set amidst willows. It was circulated during the French Revolution as a clandestine tribute to the royal family. For if we don't focus on the urn, but on the background, we discover the profiles, facing each other, of Louis XVI and Marie Antoinette and, guided by these cues, two further heads, presumably of the Dauphin and some other victim, made by the outline of branches and twigs.

The principle here exploited by a hum- ble draftsman has played a great role in the discussions of twentieth-century psy- chologists—it is the relation between "figure" and "ground." As long as we regard the urn as the figure we are not aware of the shape of the ground. Here, therefore, is the simplest case of all where our reading depends on our initial inter- pretation. We tend to regard the enclosed and articulated shape as the figure and to ignore the background against which it stands. But this interpretation itself is based on an assumption which the artist may choose to knock away. It is then that we discover that there really is a phase prior to the identification of the jug or the urn—the decision on our part which to regard as figure and which as ground.

This is the moment to introduce a con- temporary artist whose prints are medi- tations on image reading. His name is M. C. Escher, and he lives in his native Holland, keeping more contact with mathematicians than with artists and critics. It is indeed doubtful how much the critics would approve of his ingenious exercises in applied geometry and psy- chology. But to the explorer of the prose of representation, his nightmarish conun- drums are invaluable. His double image of *Day and Night* (Fig. 5) demands an imperceptible switch from figure to ground: The white birds flying across the dark toward the black river come from another side of the world where there is still daylight and where black birds go the other way. And as we search for the dividing line between the two halves, we notice that there is none. It is the interstices between the white birds— the ground—that gradually assume the shape of the black birds, and these checkered patterns merge downward into the fields of the countryside. Easy as it is to discover this transformation, it is impos- sible to keep both readings stable in one's mind.

The day reading drives out the night from the middle of the sheet, the night reading turns the black birds of the same area into neutral ground. Which forms we isolate for identification depends on where we arrive from. Reading becomes alternative "reading into"; representation merges with guided projection.
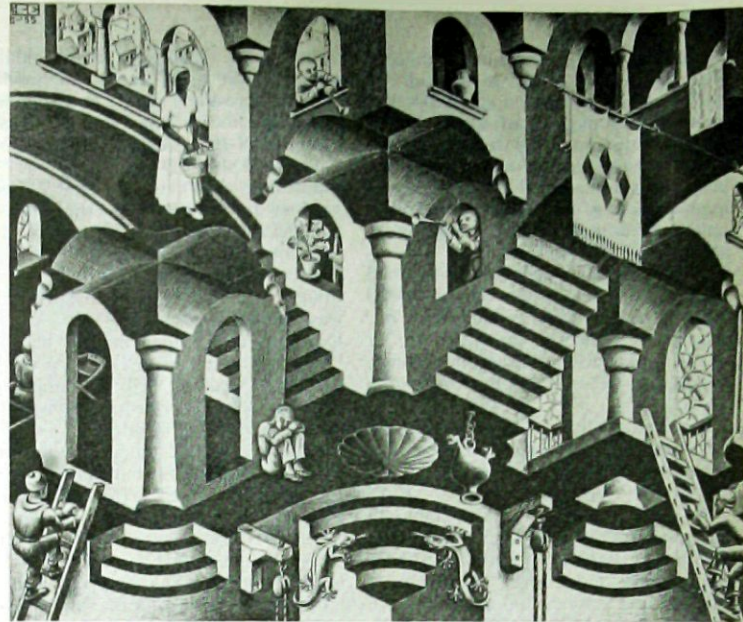
Fig. 6. *Solid and Hollow*. Lithograph. M. C. Escher, 1955.

But Escher has more tricks in his bag to undermine our confidence in the sim- plicity of representation. His print *Solid and Hollow* (Fig. 6) makes use of other forms of ambiguity which had been known to artists and psychologists for a long time, but had never been explored and exploited with such single-mindedness.

Here it is not the relationship between figure and ground that is reversed on the other side, but the very shape and direc- tion of any part of the architecture. Start on the left with the black woman walking over a curved bridge toward some stairs. As long as you stay on her side of the picture you are presented with a weird but plausible view of an old town. Start with the man climbing a ladder on the opposite side and you will read the shapes as equally coherent forms representing an unfinished courtyard with a bridge vaulting over it. But once again either reading is contradicted when you read on toward the central axis. For what looks like a pavilion seen from the out- side, if you approach it from the side of the black woman on the bridge, is switched into a vaulted corner when seen from the other side. The switch is all the more puzzling as the identical shape nearby must surely be read as a solid pavilion. But soon we discover the same punning with inside and outside all over the print. The floor on which a boy has fallen asleep is a ceiling nearby from which a lamp dangles. Everywhere corresponding shapes must be read as hollow in one context and solid in another and, every time, the meeting of both readings creates a stalemate. The assumption with which we have started breaks down, and we

have to begin all over again, only to discover that here too we are led into perplexity.

But even this probing of the mecha- nisms of image reading is not the most disconcerting of Escher's exercises. The *Belvedere* (Fig. 7), completed in 1958, may not be very pleasing as a print, but as a demonstration piece it trumps the others. For what looks at first like a rather crude historical illustration is, in fact, a brain teaser of no mean ingenuity. It would make an excellent test of the powers of observation to time the mo- ment when it dawns on the beholder that he is confronted with a self-contradictory structure. Look at the ladder and try to locate it in space. You will find that it leads from a first-floor terrace to a second at right angles to it. The man with the plumed hat on the lower terrace looks out into the landscape behind, the woman under the corresponding arch of the floor above looks sideways. Small wonder, for the arcades of the lower terrace are not composed of columns carrying the vault above them; they are interlaced, as it were, shifting from back to front as we trace their course.

Who can blame the poor imprisoned man in the cellar who looks with amaze- ment at the designer on the bench, for the object he holds in his hands is as unrealizable as the building itself: a cube with interweaving sides.

Whatever we may think of Escher's artistic taste, his prints are worth a whole course in the psychology of perception and its relation to art. Their complexity is far from whimsical. It reveals the hid- den complexity of all picture reading.
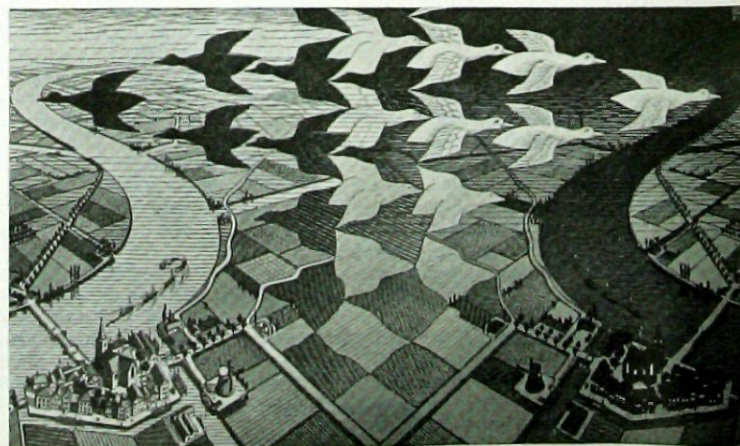
Fig. 5. *Day and Night*. Woodcut. M. C. Escher, 1938.

When we look at a normal representation, there is nothing to prevent us from forming a hypothesis about the figure-ground relationship or about the way the shapes add up to pictures of objects. We therefore believe that we take in the picture more or less at one glance and recognize the motif. Our experience with Escher's contradictions shows that this view is mistaken. We do read a picture, as we read a printed line, by picking up letters or cues and fitting them together till we feel that we look across the signs on the page at the meaning behind them. And just as in reading the eye does not travel along at an even pace gathering up the meaning letter by letter and word by word, so our glance sweeps across a picture scanning it for information.

Critics like to tell us how the artist "leads the eye" along the main lines of his composition. But our roving eyes will not be thus led. The critic's phrase should have become obsolete when eye movements could be filmed and fixation points

Fig. 7. *Belevedere.*
Lithograph. M. C. Escher, 1958.

plotted on pictures. These records confirm what Escher made us suspect: Reading a picture is a piecemeal affair that starts with random shots and gradually adjusts to the coherence of the work.

The first truth, which Escher's visual paradoxes illuminate is this piecemeal character of picture reading. There is a clear limit to the visual information we can process through any given glance. This fits in well with the results of scientists who have studied this limit in the severely practical context of how many pointers a pilot can read at a glance on an instrument panel. His capacity will, of course, vary according to training and experience, but the basic fact remains that the eye can take in much less at one glance than the layman imagines. But what about the musician who can read an orchestral score with surprising ease and at amazing speed? Does he not have to take in information at an uncanny rate? Certainly the feat is admirable, but it is only possible because the notes of the score, unlike the pointer readings, are not random signs. Music is an art that follows certain laws or rules and enables the musician to scan the score with certain expectations. Though he cannot know what to expect in the next bar, he knows at least that many possibilities are ruled out. Indeed, if any of those occurred he would probably disregard them as a misprint.

In reading a familiar language, of course, we proceed in a similar way, looking ahead for cues to confirm our expectations and filling in the remainder more or less from experience. The reading of pictures must follow a similar pattern. But once we set ourselves to read the "score," the need to revise our expectations makes us aware of the part which assumptions play in the reading of images.

What, more precisely, are these assumptions? Take any isolated part of Escher's print, the outside terrace, for instance, with its checkerboard floor and the low walls surrounding it. This is quite a normal realistic representation of an architectural feature and does not differ much from a photograph or picture post card of such a motif. How is it that we take in such a situation with such speed and ease? Surely because we are in no doubt on how to supplement the information with which the picture supplies us. We assume that a pavement will most probably be level and a wall upright, that the slabs of the floor will be square and the seat of the bench rectangular. If the shapes representing these objects are tapering and unequal in size, this will obviously be due to foreshortening and perspective.

Assumptions of this kind are so ingrained in us that it needs quite a jolt to prevent our interpretation from running along these convenient grooves. Yet, after all, there could be such things as sloping floors with irregularly sized slabs, tapering walls or rhomboid benches. Such odd shapes might serve a very good purpose in the theater, near the back of an illusionist stage to give the impression of greater depth. Once we admit this possibility, our assurance in reading the image collapses. We discover the hidden ambiguity in all representations of solid objects in the flat. If the reader enjoys a whirling head he can now return to a fresh scrutiny of all the three Escher prints (Figs. 5–7) to discover that these teasing images are "ambiguous" only on the assumption that floors or ceilings are horizontal, columns upright or the water of rivers reasonably level so that the bridge across it cannot lead uphill. Drop this hypothesis of simplicity, and the neat ambiguity of a mere double meaning sinks into chaos.

We return from this giddy switchback ride with one tormenting question in mind. If the prose of ordinary representations hides such unsuspected ambiguities, what about the reliability of our eyes to tell us about the real world? We need not worry too much, for here the answer is more reassuring. To put the matter briefly, pictures are infinitely ambiguous because they present a flat two-dimensional geometrical projection of a three-dimensional reality. To say of such a projection that it "looks like reality" begs the question. It may, but it also looks like an infinite number of unreal configurations. But this type of ambiguity will rarely trouble us in real life. After all, we experience the real world by moving about it, and our eyes are eminently suited to guide us.

The eyes alone can quickly resolve the question of the real shape of a terrace, for we have a built-in predictor that tells us how any given shape will change when seen from different angles. If one moves straight toward a door, its shape will remain constant, but its size will increase at a predictable rate. The object near the fringe of our vision, on the other hand, will be transformed in shape in a regular and predictable sequence that we can study if we move a film camera in the same direction. It is this melody of transformation that would be entirely different if we moved toward a flat or shallow perspective stage.

The decisive part that movement must play in our visual orientation has only recently been fully brought out by psychologists, notably by James J. Gibson. Here, too, a fresh alternative shocked us into awareness of an old truth we had lazily taken for granted. The problems of vision in rapid flight or even in motoring rendered the old idea of static vision obsolete. Moreover, our engineers had meanwhile learned to simulate the function of sense organs with the uncanny gadgets of homing devices, used in the deadly game of missile development. Cybernetics has taught us to look even at the senses not as passive registration devices but rather as receptors geared to the receipt of a flow of information, which the nervous system is somehow programed to compare with expectations. Some psychologists think that the simplicity hypothesis, the idea that the floor is "probably" level, may be built into our receptor organ. But whether they are inborn or acquired, it is now clear that every message sets up a set of expectations with which the incoming flow can be matched to confirm correct assessments or to modify and knock out false guesses.

In looking at a picture we are deprived of this dynamic aid for the weeding out of false interpretations. All we have is a consistency test that compares the messages from various parts of the picture for compatibility. Having done so, our mind makes ready for further tests through movement, but here it is frustrated. This frustration has a curious side effect that can paradoxically increase the illusion and will never cease to tease our reason. It is the illusion that objects pointing toward us from paintings will follow us as we shift our position.

The most bored and footsore tourist will spring to attention when the guide demonstrates the ancestral portrait that follows him with its eyes or the pointed gun that always aims at him wherever he stands in the hall. It is easy to dismiss this surprise as naïve, but less easy to exhaust the implications of this little mystery. One thing is sure: The mystery does not rest in any particular skill on the part of the painter. The effect is quite frequent and indeed inevitable. The only reason why we need the guide's patter to enlist our attention is that we are but rarely interested in what happens to the appearance of a painting while we shift our position in this way. If we were, we would see that the principal condition for the effect is a sense of depth combined with an unforeshortened portion of an object that appears to lie quite close to the frontal plane.

The woodcut by the German Renaissance artist Hans Baldung Grien (Fig. 8), for instance, fulfills these conditions admirably. It is known under the title "The Bewitched Stableboy" and it shows the victim of some evil spell lying on his back, the soles of his feet turned toward us. Critics have wondered what the picture signifies, but surely it is meant to tease us with this magic trick. When we have it in front of us, it works like any ordinary perspective. The strong foreshortening is "read" as depth, and we feel the three-dimensional character of the representation as a compelling illusion. It is consistent with this reading that we should look straight at the soles of the man's shoes and that they should hide from us his feet and ankles which we imagine to be there. But the more firmly we project the image of the whole figure into these marks on the paper, the more will we instinctively expect it to respond to our usual reality tests. A real figure would present different aspects to us if we moved sideways. But since what we have in front of us is not a three-dimensional figure but only a flat piece of paper, the expected melody of transformation fails to materialize.

What makes this experience remarkable in our context is the confirmation it provides for our argument that the picture becomes a picture only if the marks on the paper are sorted out by the mind into a consistent and coherent message. Once this consistency is perceived and an interpretation emerges, it takes a great effort to dislodge it. Easy though it is to know intellectually that our poor stableboy's head lies objectively in the same plane as do his feet, we still do not quite see it that way.

It is here, at last, that these investigations of the prose of representation lead back to the problems of artistic poetry. For it is the strength of the forces of illusion that alone accounts for the violent reactions against these forces in twentieth-century art. At all times, of course, the aesthetics of picturemaking had more to do with composition than with illusion. Artists have always been poets, striving to achieve a fine balance of shapes and colors and to devise a beautiful pattern to fill the painting surface in a pleasing way. But these efforts could easily be destroyed by the reading mind that rearranged these shapes in an imaginary depth.
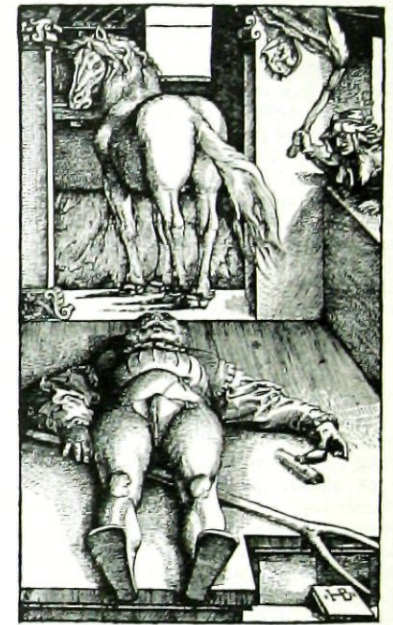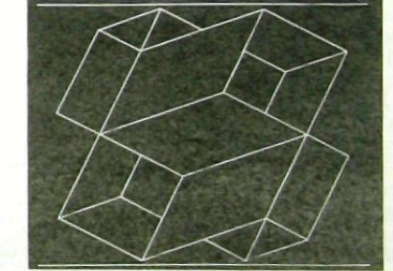

Fig. 8. *The Bewitched Stableboy.*
Woodcut. Hans Baldung Grien, 1544.

Critics wrote and still write as if we could see both the surface and the representation, but artists knew better. Their rebellion against illusion came into the open more than fifty years ago in those conundrums of cubism which lead our eye a frustrating chase after guitars and bottles, teasing us with false clues only to entrap us in contradictions. It was by exploring these paradoxes that artists wanted to discover new modes of organization.

It is not only Escher who shows us their success. Even abstract art owes some of its most interesting possibilities to the fascination of unresolved ambiguities (Fig. 9). By presenting us with these scrambled codes the artist shocks us into realizing how much more there is in pictures than meets the eye. THE END

Fig. 9. Drawing. Josef Albers, 1958.