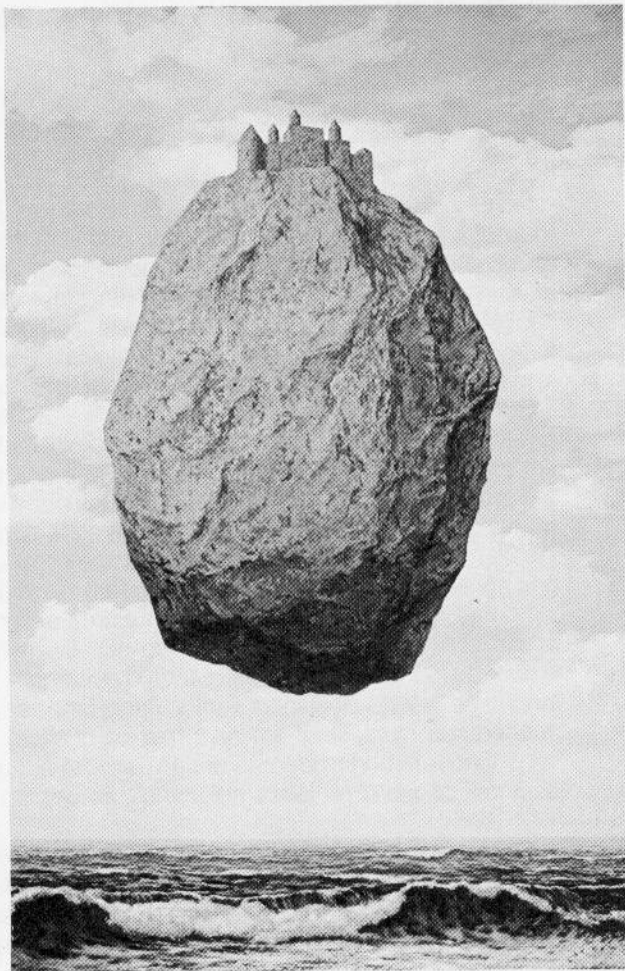


ART SYNECTICS

By Nicholas Roukes



Davis Publications, Inc.
Worcester, Massachusetts

For Diane

Cover: *The False Mirror (Le Faux Miroir)* by René Magritte, 1928, 21 1/4" x 31 7/8" (54 x 80.7 cm.), oil on canvas. Collection, The Museum of Modern Art, New York.

Title Page: *The Castle in the Pyrenees* by René Magritte, 1959, 79" x 59" (200.6 x 133.7 cm), oil on canvas. Courtesy Harry Torczyner, New York.

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PREFACE

The basic task in the creative process is to bring together, in some useful fashion, ideas which are usually remote from each other.

S.A. Mednick

The term *Synectic* is from the Greek *Synektikós*, which means "bringing forth together" and "bringing different things into unified connection." This is a form of creative thinking that combines imagination and analogical thinking in order to transform commonplace, familiar elements into new and unusual structures. Through various processes of mixing and matching, exciting metaphors and visual analogues are produced. Since Art Synectics involves the process of fusing disparities, it demands a tolerance for ambiguity and for the initial chaos that accompanies the process of mixing highly diversified elements.

Edgar Allan Poe once described himself as "often drifting into unthought-like thoughts that are inclined to undermine and supercede logic" — an insight into the importance of by-passing the logical brain that often tends to curb radical thinking. For "unthought-like thoughts" — synectic thinking — appeal to the integrated brain: to the intuitive intelligence that stems from our emotional and psychological makeup, and to the logical and more rational brain that allows us to "nail down" feelings and perceptions into hard facts and tangible structures.

In his book, *Synectics*, William J.J. Gordon summarizes three fundamental characteristics of synectic theory: (1) creative output increases when people become aware of the psychological processes that control their behavior; (2) the emotional component of creative behavior is more important than the intellectual component, the irrational is more important than the rational; (3) the emotional and irrational components must be understood and utilized as "precision tools" in order to increase creative output.

This book is divided into six chapters: Analogy; Imaging and Transforming; Signals, Signs, and Symbols; Myth and Mythmaking; Ritual, Game, and Performance; and Paradox. Each chapter contains an overview regarding the selected theme, along with exercises, games, and activities for studio or classroom use. The purpose of *Art Synectics* is to encourage creativity in art through experiences that involve unconventional associations of ideas and images. It is the writer's hope that this book can be used as a creative tool for transforming ordinary perceptions into extraordinary, exciting, yet cohesive structures.

A guiding principle in writing *Art Synectics* was taken from the words of Christopher Morley: "The purpose of a book is to trap the mind into doing its own thinking."

N.R. Calgary, Alberta, Canada

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CHAPTER 1

ANALOGY

Poetry is the achievement of the synthesis of hyacinths and biscuits.

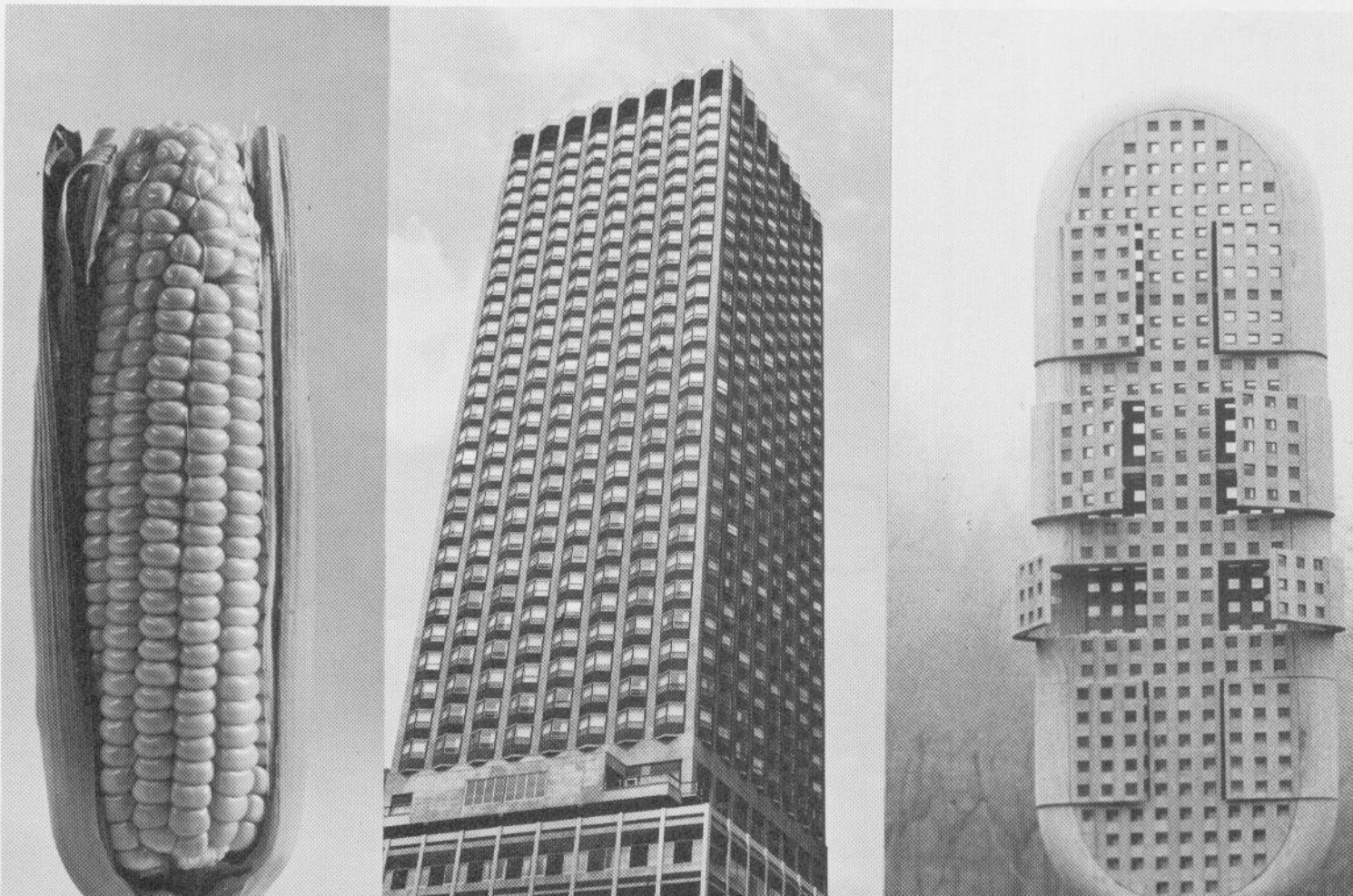
Carl Sandburg

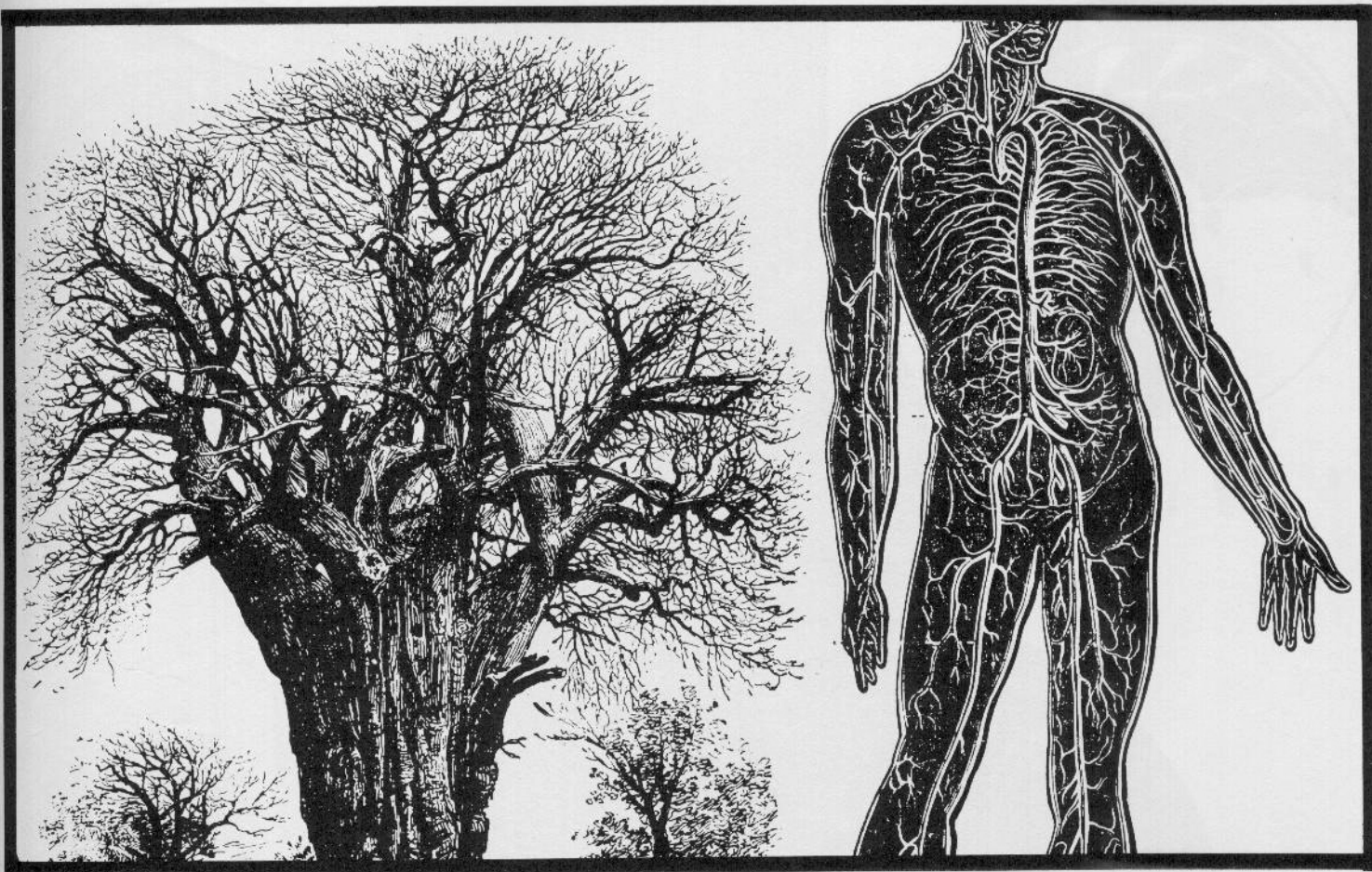
ANALOGY: (a-nal-o-ji) Gk. Equality of ratios, proportion; an agreement, likeness, or proportion between the relations of things to one another. Century Dictionary

In its literal definition, the term *analogy* means “according to ratio.” However, in its broader use it implies any similarity between things that are otherwise unlike. As artists, we are interested in analogical thinking because it is an effective tool for stimulating the imagination. By making mental comparisons, or analogical links, known relationships between dissimilar elements can be transferred to each other — and a whole new world of insight, thought, and imagery is possible.

Analogies are convenient ways of intuiting or subjectifying knowledge and experience, whether used simply to make comparisons without “trying to prove anything,” or in more sophisticated attempts to derive poetic metaphors. Sandburg’s famous line, “the fog comes on little cat feet,” is an example of analogy used as a poetic device in literature. The painting by Morris Graves, on the other hand, is a visual analogy that equates certain lines and shapes drawn on the canvas with qualities of sound.

1. Visual analogy: although radically different in scale and function, an ear of corn, a high rise building, and a contemporary sculpture are found to have common design qualities that link them as visual forms. The sculpture, **Grande Stele**, is by Rivadossi Giuseppe, 102-1/4" x 20-1/4" (259.7 x 52 cm), wood. Courtesy the artist.





Classifications

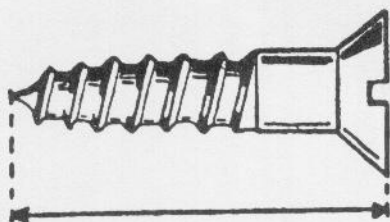
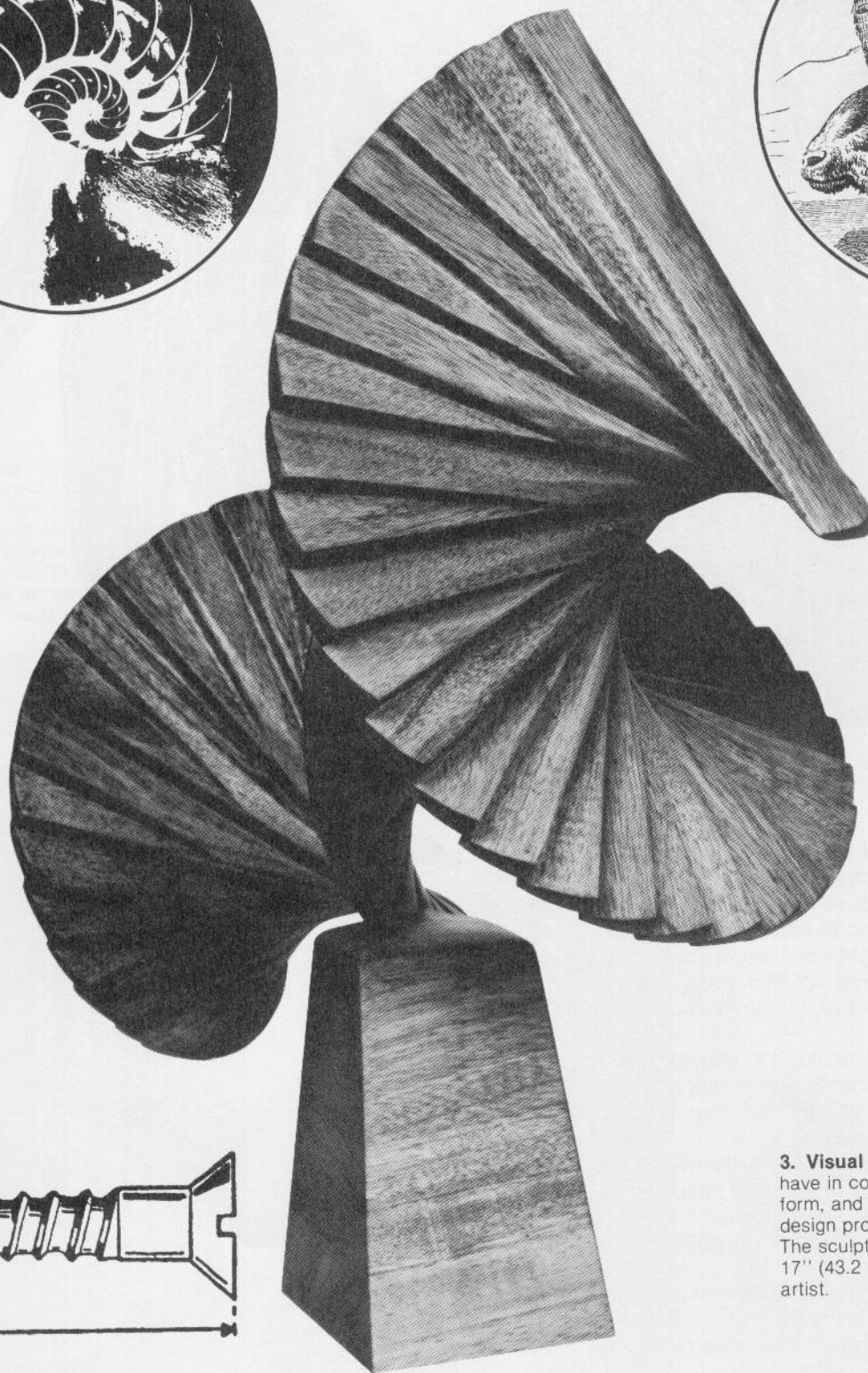
Analogies may be classified as either *symbolic* or *nonsymbolic*. Nonsymbolic analogies are simple comparisons of different things that in some way resemble each other, either on a logical, sensory, or emotional level. Symbolic analogies, on the other hand, are *metaphoric* in nature; the properties transferred to each other tend to ignite or spark an insight to a "larger idea." For the sake of discussing and applying analogy to the study of Art Synectics, four basic classes of analogy are presented: (1) logical, (2) affective, (3) synaesthetic, (4) paradoxical.

Logical Analogies. Logical analogies infer similarities of design, structure, or function between diverse elements. For example, a duck can be compared to an amphibious boat, the skeleton of a fish to a tree, the meandering pattern on the surface of a coral to a river, and so on.

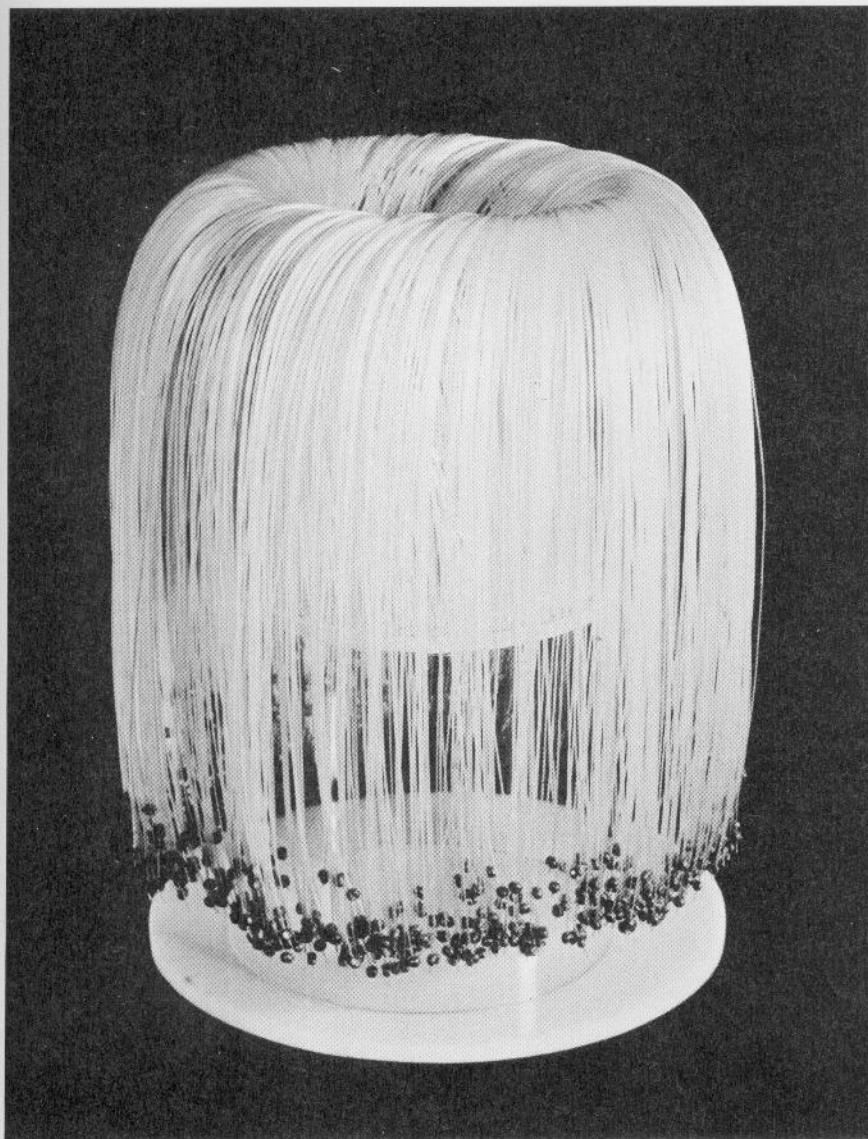
In seeking structural analogies, the artist might compare the design of a bridge to the structure of the human skull — or to the cross section of a bird's wing. Here the artist is not concerned merely with similar surface appearances, but is seeking similarities in design logic or engineering systems that can be transferred from one subject to another.

Functional analogies compare the working operations of one system to another, as when the human nervous system is compared to the electric wiring system of a radio transmitter and receiver, the propulsion system of a squid to that of a jet aircraft, and so on.

2. Logical analogy: the system of a tree is compared to the vascular system of the human body.

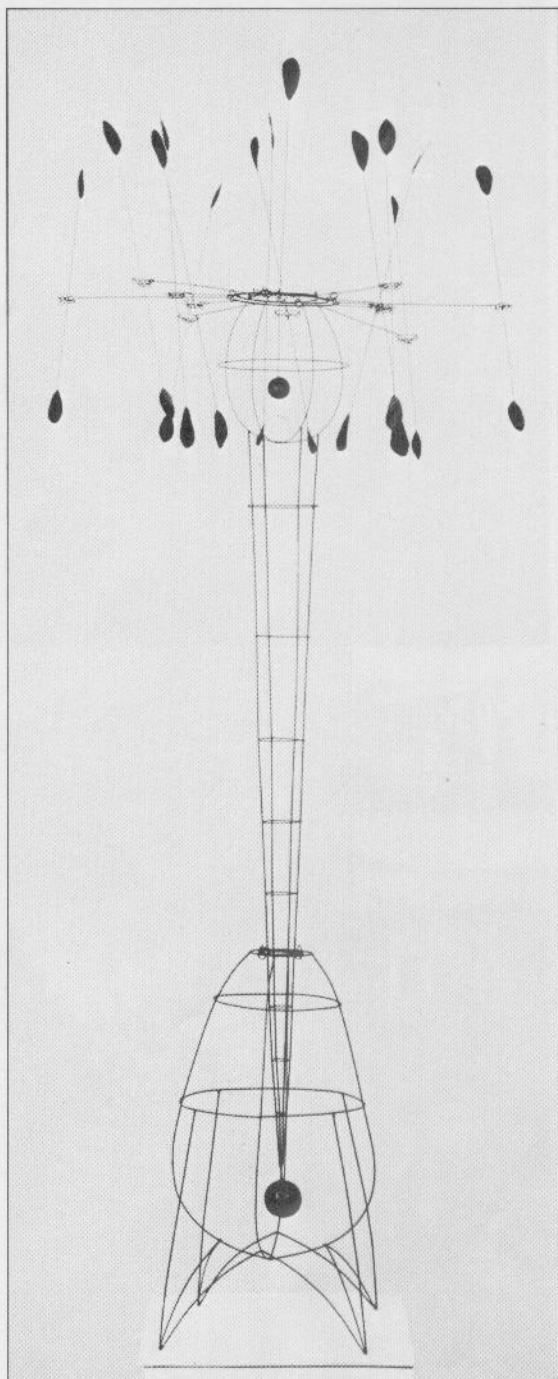


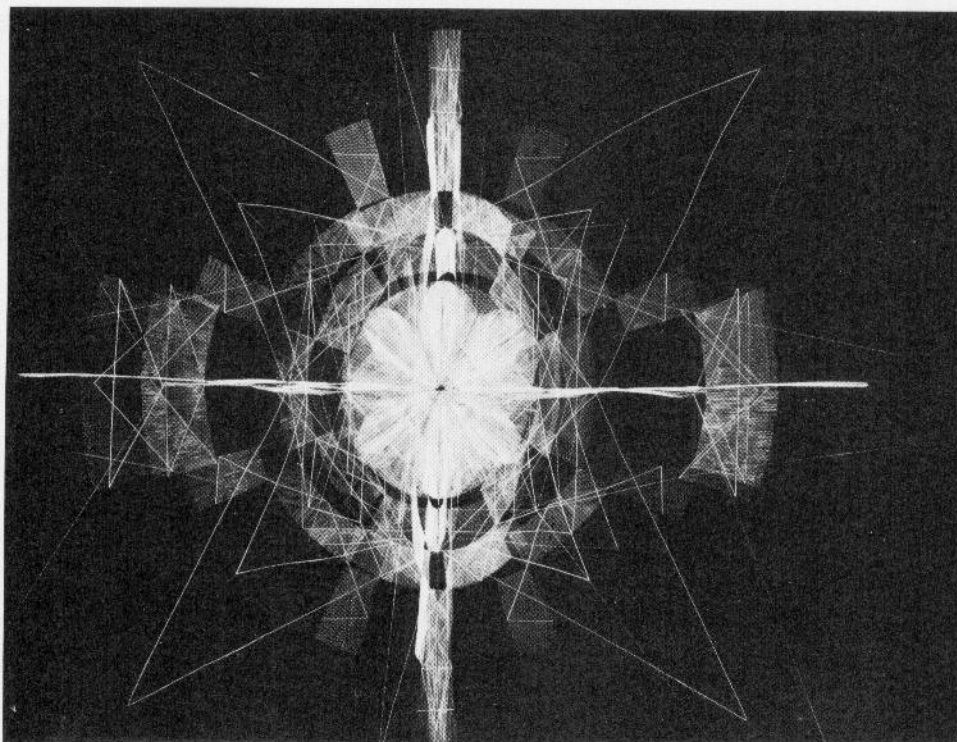
3. Visual Analogy. What do these images have in common? Although differing in shape, form, and function, all share a common design property — a spiral configuration. The sculpture is by Mario Dal Fabbro, 1974, 17" (43.2 cm) high, Mahogany. Courtesy the artist.



4. Vortex by Graham Boyd, 1972, acrylic, nylon monofilament, fishing weights. This is a structural analogy of a phenomenon of nature inspired by the observation of swirling masses of water.

right: 5. Flower by Konstantin Milonadis, 38" (96.5 cm) high, music wire. Courtesy the artist. Inspired by organic growth and form in nature, the artist has created his own visual equivalent of a flower — a finely balanced construction made of steel wire.

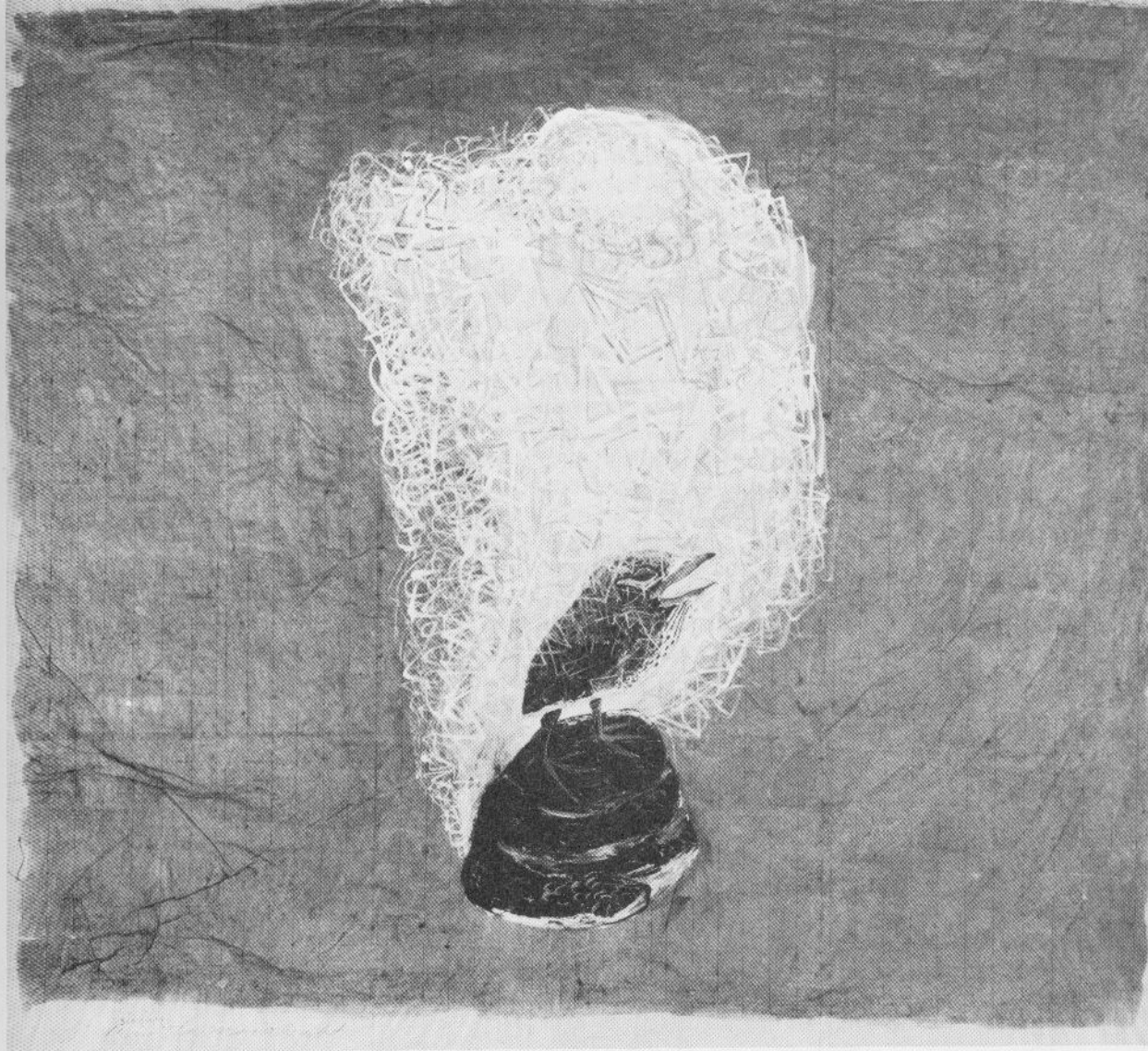




left: 6. Variations within a Sphere, #10 by Richard Lippold, 1956, 5-1/2' (1.7 m) in diameter, gold-filled wire. Courtesy The Metropolitan Museum of Art, New York. Radiant solar energy is the subject of this skillfully crafted, sculptural analogue.

below: 7. Birthday by Marc Chagall, 1915, 31-3/4" x 39-1/4" (80.6 x 99.7 cm), Oil on canvas. Courtesy the Museum of Modern Art, New York. Chagall's work is an example of affective analogy synthesized in a visual form. Drawing more from his personal feelings regarding the subject rather than concern for proportion, the artist takes major liberties in abstracting the elements in his composition.





Synaesthetic Analogies. Synaesthetic analogies are sensory comparisons of an *interdisciplinary* nature: perceptions of touch, sound, vision, taste, or smell can be transferred from one sensory mode to another. For example, in the landscape entitled *Foghorns*, Arthur Dove visualized sound in a graphic form. Musical compositions are often synaesthetic notations of visual, tactile, and/or olfactory perceptions as well.

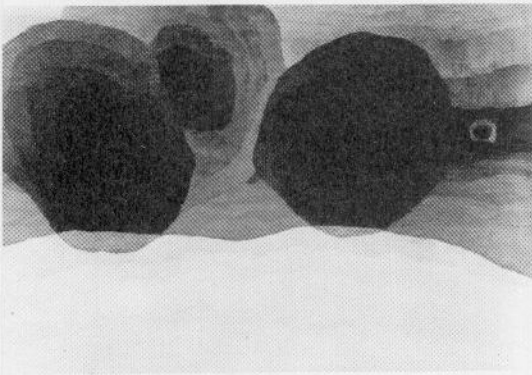
Affective Analogies. Affective analogies are *emotional* resemblances, as when an offensive person is regarded as a snake or a skunk; a beautiful girl as a flower, peach, or honey; an innocent child as a lamb; an aggressive person as a bull or a tiger; a timid person as a mouse, et cetera. Visual images can be *subjectified* through *empathic projection*. When we empathize with someone or something, a strong personal identification is established with the subject. The empathizer projects special feelings and emotions into the subject, whether the subject be another person or living thing, or even an inanimate object such as a rock.

Many scientists and inventors have made major discoveries through empathic projection. The inventor T.A. Rich, for example, once imagined himself to be an electron in order to solve a technical problem. By attempting to “behave” like an electron, he gained the required insight to solve the problem that eluded him. It has been

8. Synaesthetic Analogy: Bird Singing in the Moonlight by Morris Graves, 1938-39, 26-3/4" x 30" (67.9 x 76.2 cm), gouache. Courtesy Museum of Modern Art, New York. Both abstract and representational images are combined to graphically portray the bird and the “sound” of its music.

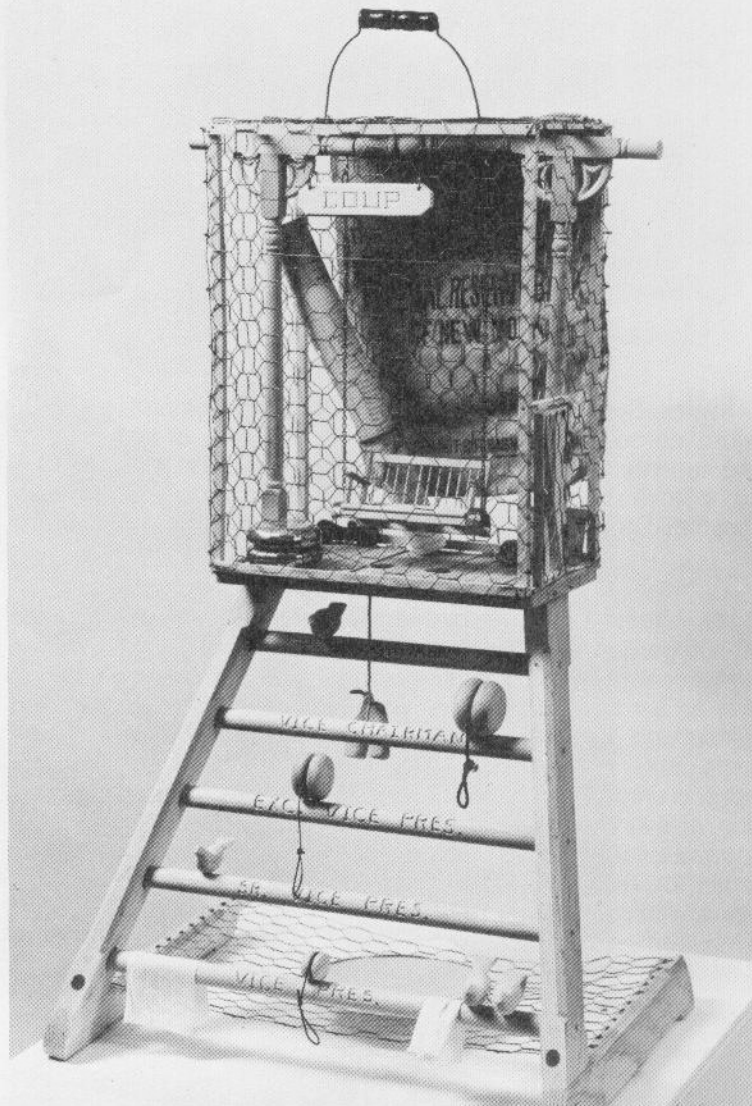
said that Albert Einstein developed his theory of relativity as a result of empathic projection: Imagining himself as a rider of a beam of light, he asked, "What would the world be like from this point of view?" In relation to art, Kandinsky's statement that "everything has a secret soul" may have prompted Jung's explanation that artists "often psychologically project part of their psyches into objects, thus allowing for their animation."

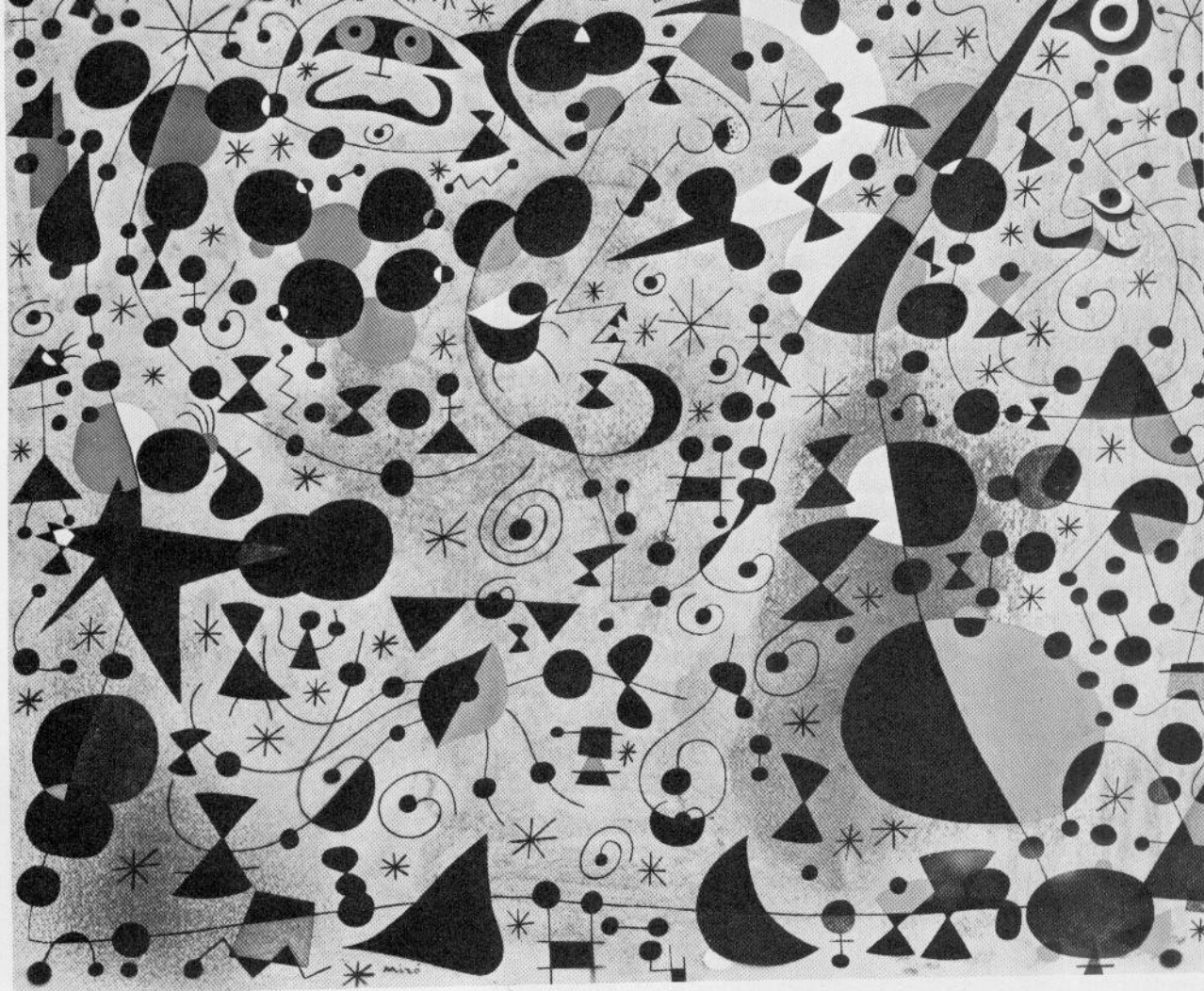
Paradoxical Analogies. In daily conversation, we often use paradoxical phrases or figures of speech: "loud silence," "the living dead", "organized confusion." In literature or art, certain combinations of words or images may also seem illogical or contradictory, but upon reflection we discover them to be well-founded. They may also be powerful metaphors in their symbolic meaning as well. Such is the case with the surreal analogies of Salvador Dali. Dali coined the term "paranoic analogy" to describe delusions he likened to dream imagery. In his early paintings, for example, we find images of heads propped up by crutches in strange landscapes. To Dali these paintings were "paranoic analogies of sleep," wherein sleep was conceived to be a state of equilibrium, or even a monster, into which bodies disappeared; only the head remained, supported by crutches. Such illogical combinations of images evoke powerful emotional responses; our minds tell us no logical reason exists for these images to be together, yet since they *are* together and cannot be dismissed from our consciousness, we are forced to reconcile them through the logic of our emotions.



9. Fog Horns by Arthur G. Dove, 1929, 17-3/4" x 25-1/2" (45.1 x 64.8 cm), oil on canvas. Courtesy Colorado Springs Fine Arts Center. The artist applies synaesthetic transfer to sensory perception and expression in order to represent sounds in graphic form.

right: 10. Paradoxical Analogy: Climbing the Success Ladder by Tommy Simpson, 1976, 45" x 24" (114.3 x 61 cm), wood, wire, metal. Courtesy the artist. The artist selects a cage-like structure combined with a step ladder to invectively portray the plight of the ambitious business executive.





12. The Poetess by Juan Miró, 1940, 15" x 19-3/8" (38.1 x 48.7 cm), oil on paper. Collection Mr. and Mrs. Ralph F. Colin, New York. Photo: Soichi Sunami. The artist conveys the sensitive qualities of a poet without the use of conventional representational imagery, relying instead on abstract design to create a pictorial analogue.

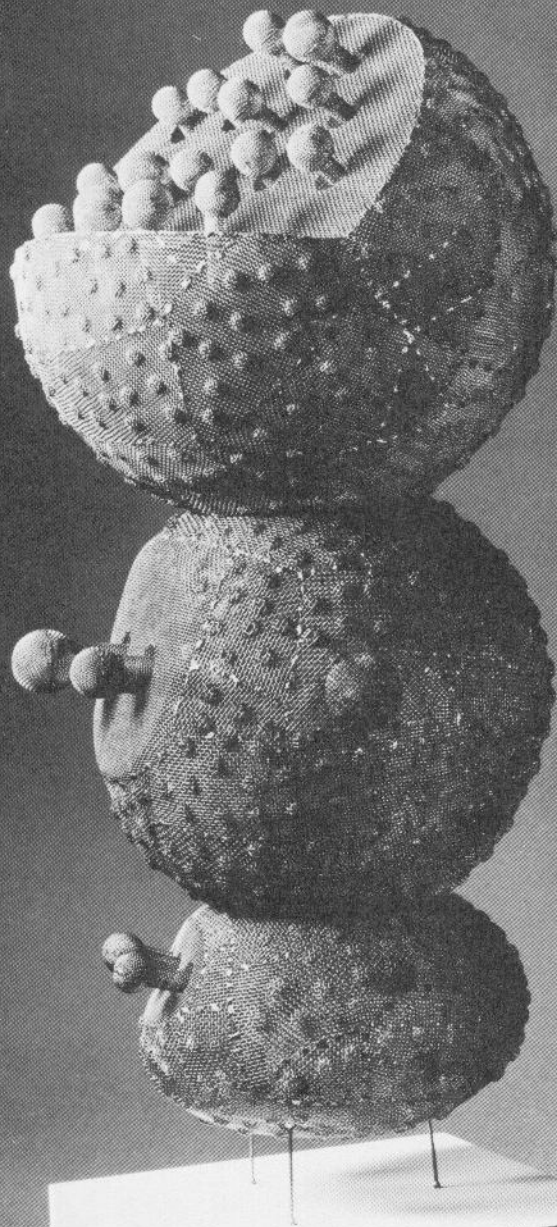
Graphic Representation

Artists create graphic images to represent subjects from the real world. All graphic images are *abstractions* that may be classified within three basic types: (1) projections, (2) likenesses, (3) surrogate images.

Projections. Projections are "point-to-point" representations of a subject: photographs, shadows, maps, drawings, paintings, and sculptures can be highly accurate representations of the original subject. Trompe l'oeil art, or the super-realistic paintings of William Harnett, fall within this category as well.

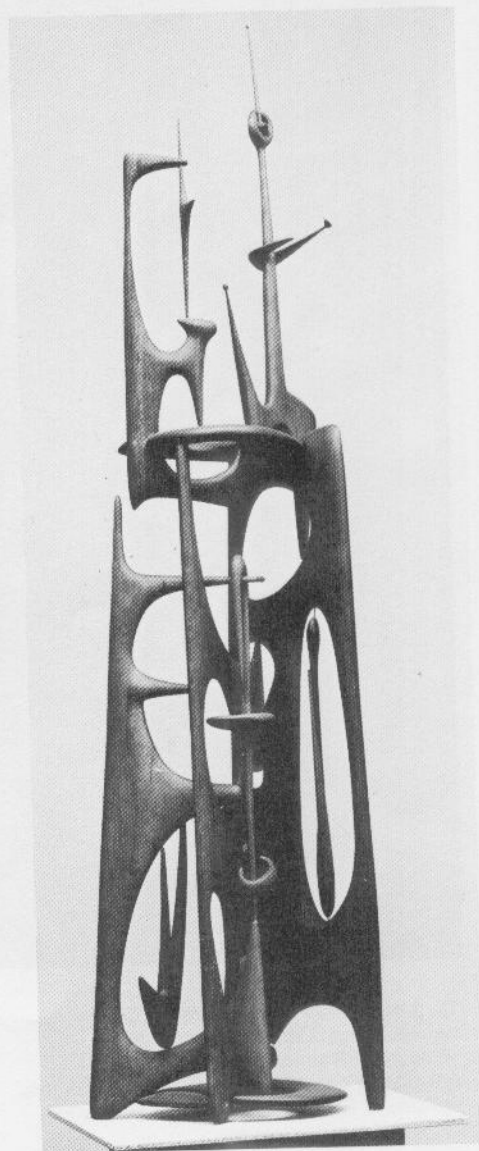
Likenesses. Likenesses are *stylized* representations of a subject; they can take the form of caricatures, simplified drawings, or any graphic form that is abstracted yet retains recognizable aspects of the original subject.

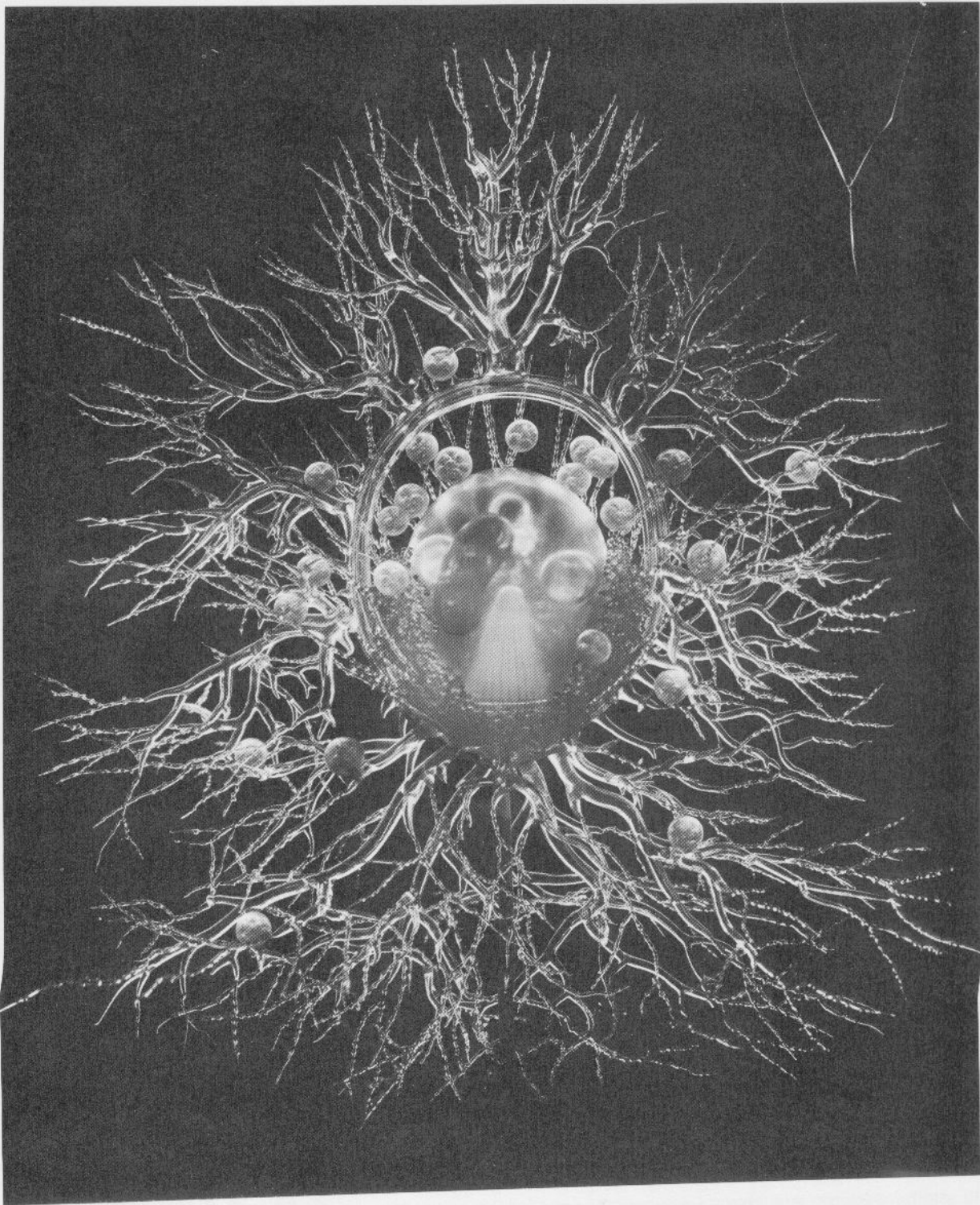
Surrogate Images. Surrogate images are representations of a *symbolic* nature; certain shapes, forms, or marks *stand-in* for the original subject. They are a kind of symbolic shorthand wherein lines and shapes that are entirely different from the original subject are substituted in order to gain symbolic expression. The portrayal of a *cube with wings of wax*, for example, may be said to be a surrogate image of Icarus, the adventurous youth of Greek mythology.



13. Ceres by Günter Haese, 1970, 21-1/2" x 9" x 9" (54.5 x 23 x 23 cm). Courtesy Marlborough Gallery, Zurich. A biotic analogue created by analysis and observation of growth forms in nature.

14. Jungle by Leo Amino, 1950, 56" x 12" x 11-1/2" (142.2 x 30 x 29.2 cm), Mahogany. Courtesy The Whitney Museum of American Art. Interpenetrating abstract shapes alluding to human-like forms suggest qualities of a claustrophobic "urban jungle."





15. **Lithocireus Magnificus** (model) by Hackel, Glass. Courtesy the American Museum of Natural History, New York. A radiating growth pattern is observed in this species of Radiolaria.

1

ACTIVITIES

1-1 / Analogical Design Systems

Concept: Finding design likenesses in dissimilar structures

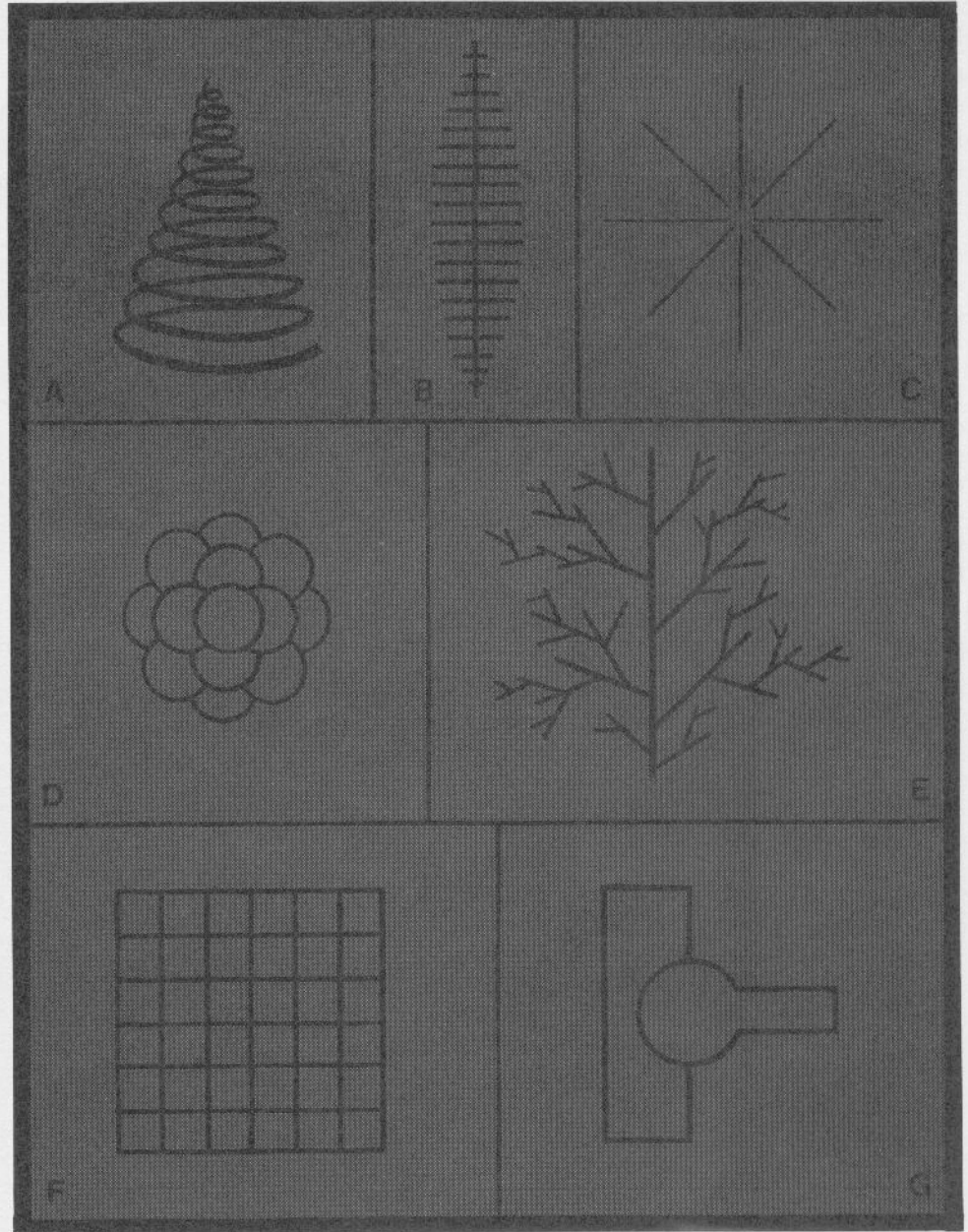
Do: 1. Examine the diagrams in the illustration (right).

2. On a sheet of paper, write down the names of the six systems.

3. Next to each category, write down as many different things you can think of that also belong to each system. For example radiating systems: wheels, sun, sea star, shower, radio transmitter, family tree, et cetera.

4. Art Activity: Make a collage. Find images that are different, yet related, because of their design properties. Paste them down to form a composition.

5. Add to the list of design systems found in nature. In addition to the spiral, vertebral, radiating, cluster, branching, and interlocking, what other categories can you think of?



16. Systems Found in Nature. A. Spiral, B. Vertebral, C. Radiating, D. Cluster, E. Branching, F. Grid, G. Interlocking.

1-2 / Abstracting Design

from Nature

Concept: Using nature as a basis for design analysis and transformation.

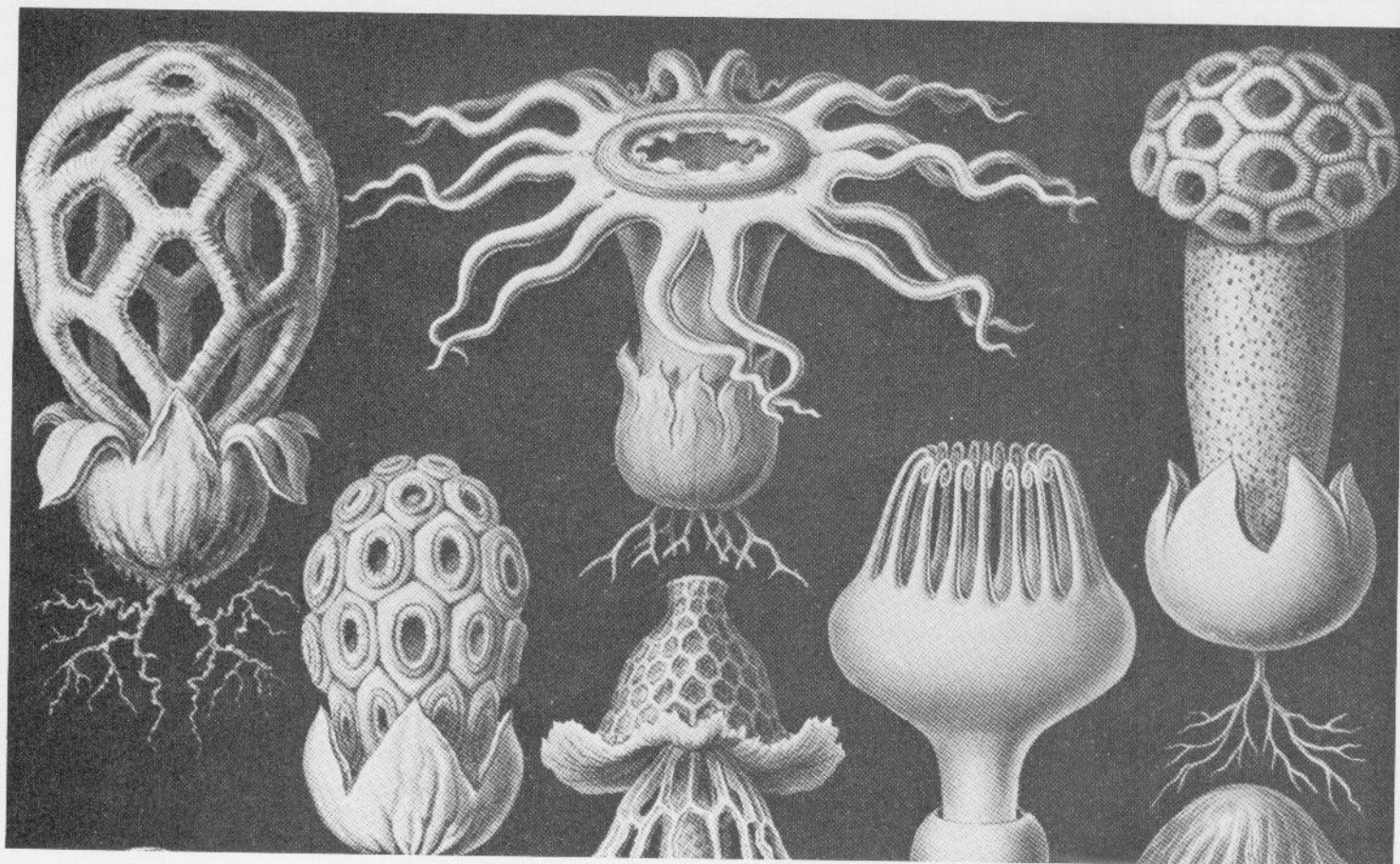
Do: 1. Carefully study the illustrations of radiolaria and diatoms on pages 14 and 15.

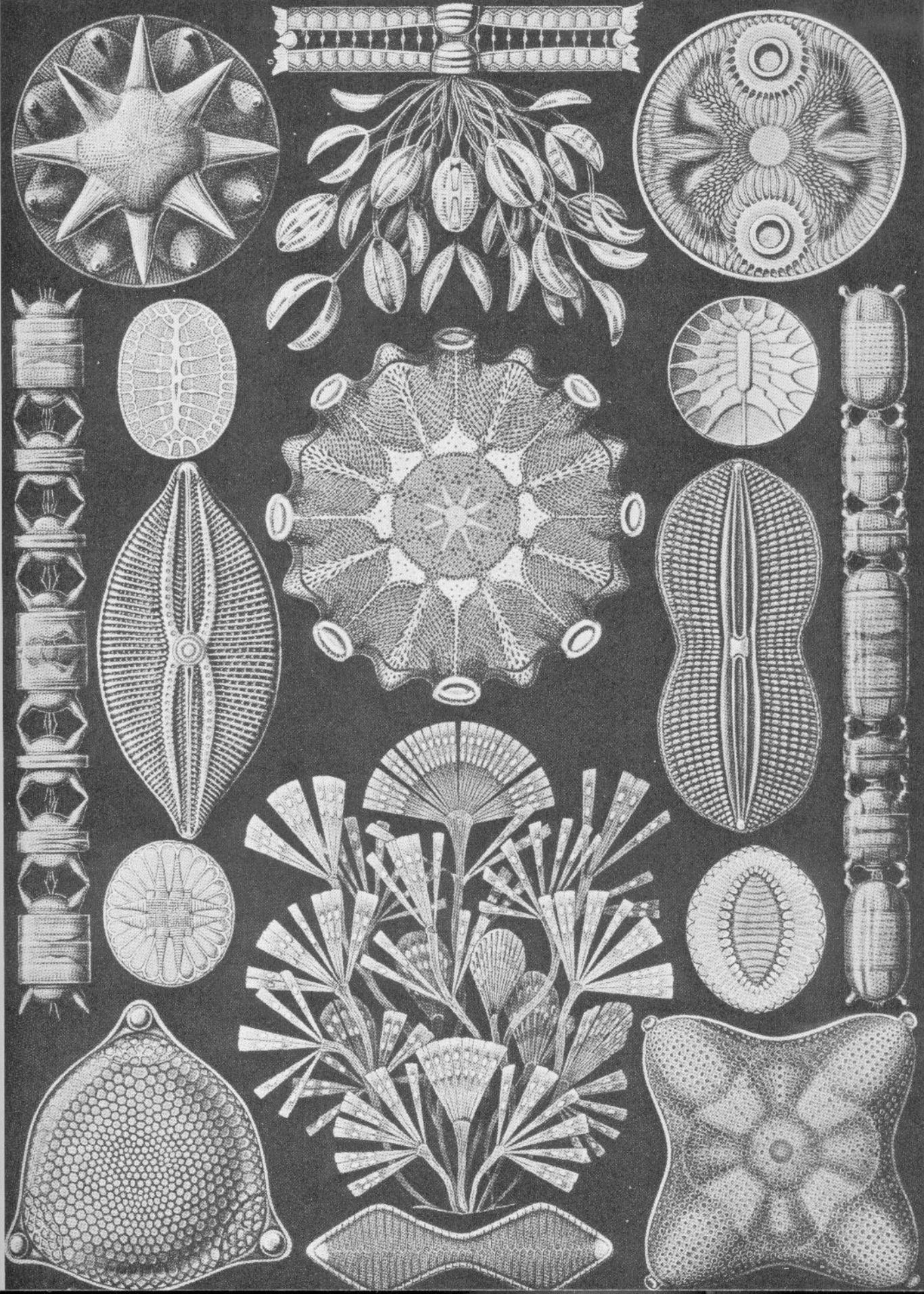
2. Make some preliminary sketches based on observations and analysis of these designs. Change, simplify, elaborate, combine, transform the images as you desire.

3. Make a cut-paper design. Cut out the component shapes of a selected drawing, along with shapes and lines to suggest surface decoration, texture, et cetera. Use colored construction paper or colored plastic-surface paper. Paste the components on a black background paper to create an abstract composition.

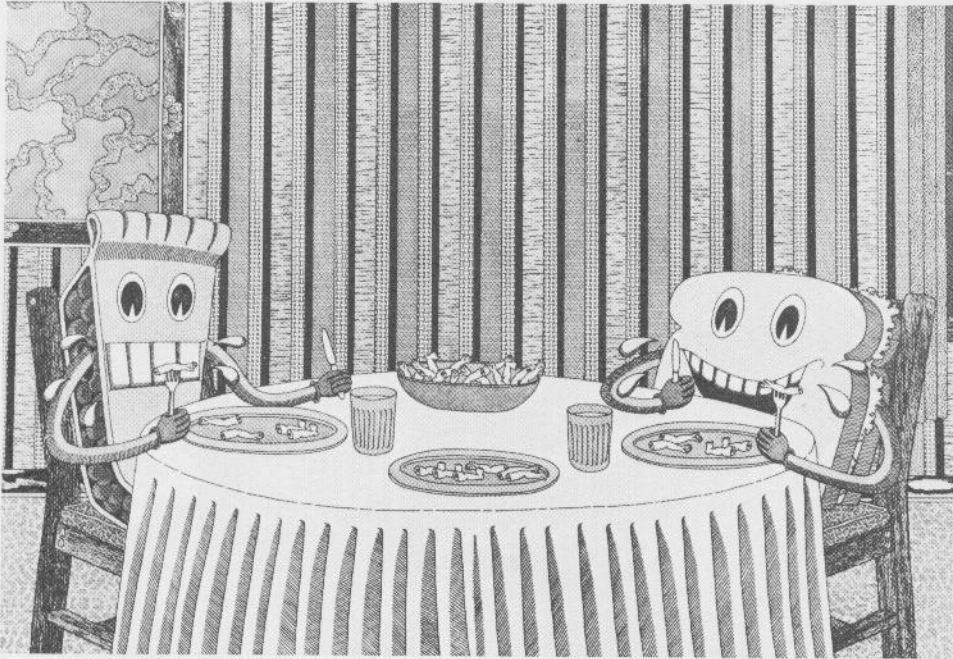
below: 17, right: 18. Radiolaria, a type of marine protozoa (below), and water-borne algae, diatoms, (right). Drawings courtesy Dover Publications (from *Art Forms in Nature* by Ernst Haeckel).

Drawings by Ernst Haeckel, published in *Art Forms in Nature*. New York: Dover Publications, 1974.

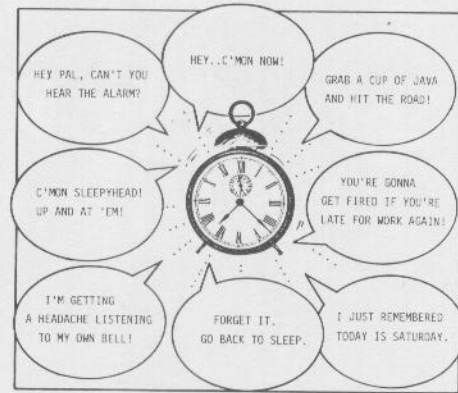




below: 19. **A Piece of Pie and a Sandwich Eating Lunch** by Marvin Jones, 24" x 30" (61 x 76.2 cm), hand-colored etching. Courtesy the artist.



below: 20. The cartoonist empathizes with an alarm clock and draws it as if it had human qualities.



1-3 / Empathic Projection

Concept: The imaginative projection of personal feelings into a selected object.

Do: 1. Identify emotionally with an object and animate it through empathic projection: Imagine you're a tree, a building, fireplug, porcupine, hammer, rock, et cetera.

2. Write a Haiku poem regarding one of the objects you've imagined yourself to be.

3. Make a drawing or cartoon of that situation.

4. Make a collage incorporating a photograph of yourself along with other collage elements.

1-4 / Situations and Similitudes

Concept: Developing imagination in perceiving relationships between dissimilarities.

Do: 1. Make two lists: one of situations, the second of "stretched" similarities. Example:

Situations	Similitudes
Potatoes frying in oil	Taking final exams
Diving off the high board	Exploring new ideas
Gluing wood together	Making friends
A snow storm	Momentary forgetfulness
Water suddenly freezing	Getting a great idea

Note: There are no wrong answers! Stretch your imagination to make unconventional comparisons.

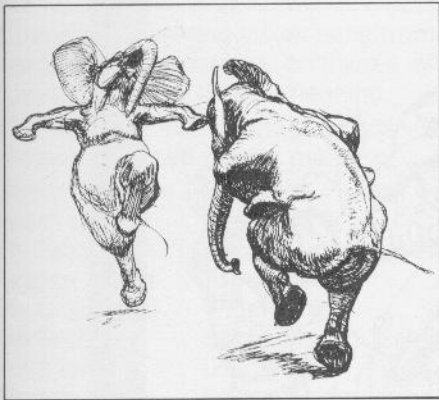
1-5 / Imagine You're an Alarm Clock

Concept: Developing skills of imagination and empathic projection.

Do: 1. Imagine you're a _____. (Fill in the blank.)

2. Make a cartoon of the character or object you are imagining. Draw a picture or cartoon in the middle of a large sheet of white drawing paper. Add cartoonist's "balloons" around the drawing and print the text that describes your feelings.

21. **The Dancers** by Heinrich Kley, pen and ink. Courtesy Dover publications. Published in *The Drawings of Heinrich Kley*. New York: Dover Publications, 1961.



Can you imagine elephants as ballet dancers? or:
Frogs ice skating?
Bugs as bionic machines?
Spoons as jet airplanes?
Guns as people?
Pencils as artists?
A loaf of bread as a deck of cards?
Shoes as pets?
Bowling pins as skyscrapers?
Clothes acting human without humans in them?

1-6 / Paradoxical Analogies

Concept: Making "impossible" comparisons

Do: 1. Make up a list of paradoxical comparisons such as the list above.

2. Visualize one or more of the situations by making a drawing, cartoon, collage, or three dimensional sculpture.

1-7 / Symbolic Thinking

Concept: Using analogy as a tool for symbolic thinking.

How is the brain like a boiler?

How is a book like a carriage?

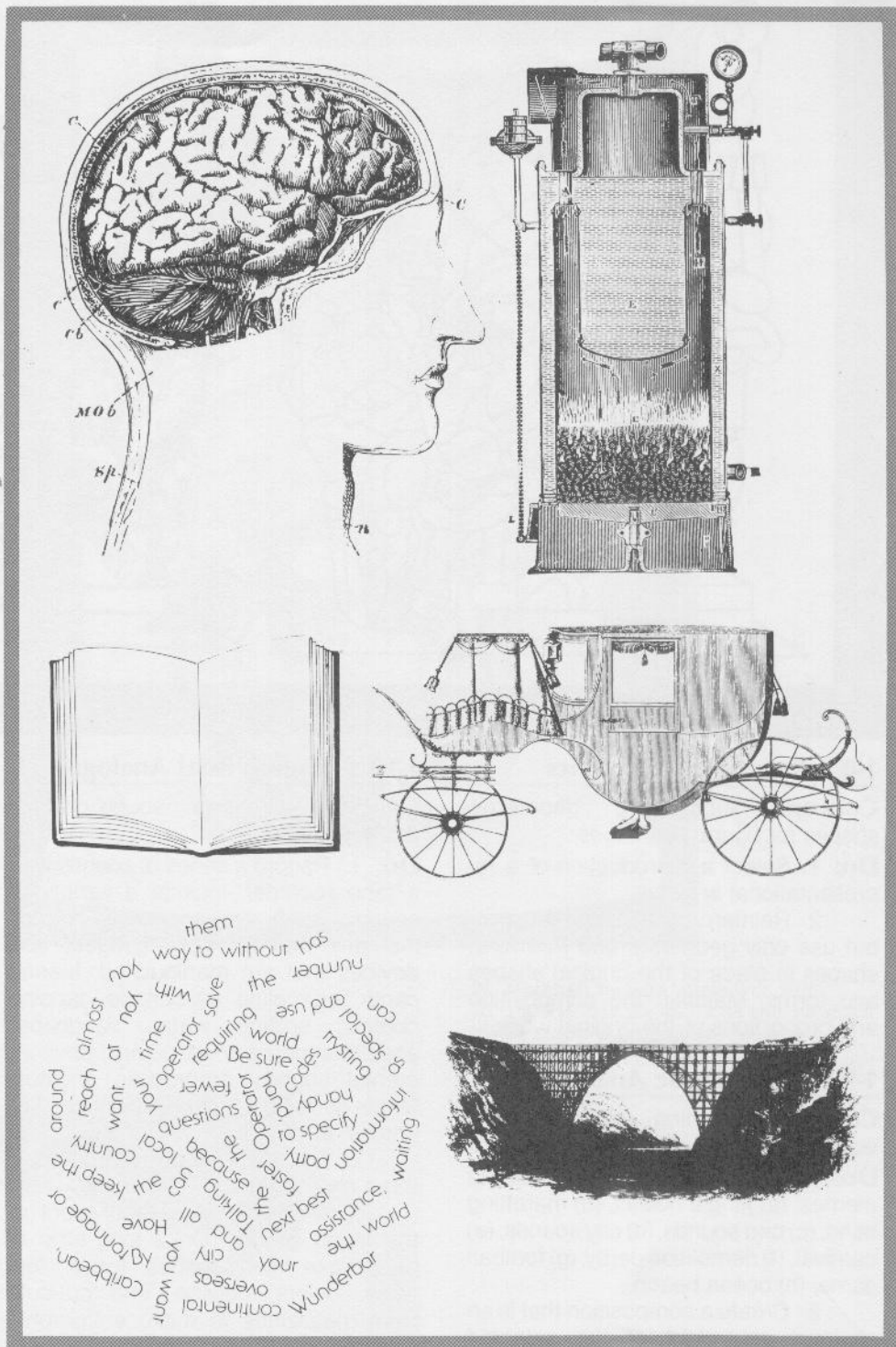
How are words like a bridge?

How is time like an eraser?

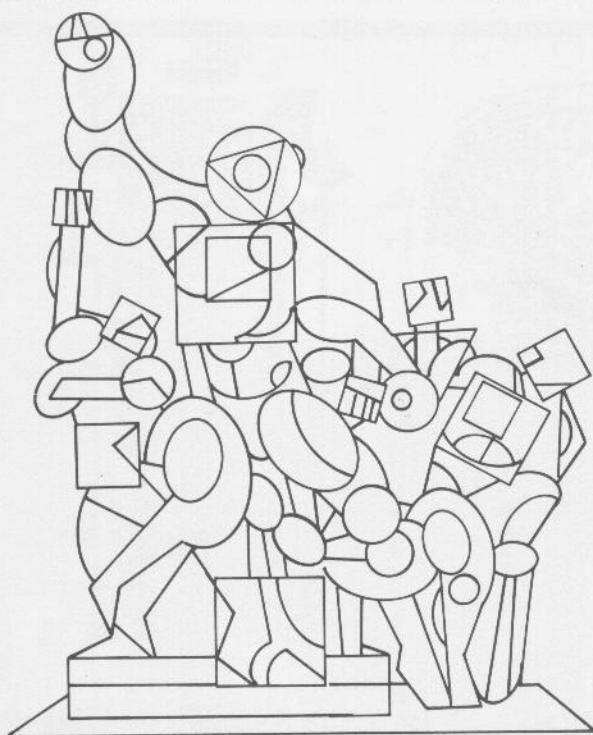
How is life like fine crystal?

Do: 1. Write out several different responses to the questions above.

2. Make up an additional list of symbolic analogies. Write out responses to each.



above: 22. **Symbolic Visual Analogy:** How is the brain like a boiler? - How is a book like a carriage? - How are words like a bridge?



1-8 / Symbolic Geometrics

Concept: Substituting geometric shapes for figurative images.

Do: 1. Select a reproduction of a representational art work.

2. Reinterpret the composition, but use only geometric and free form shapes in place of the original shapes and forms. Maintain the composition and proportions of the original work.

1-9 / Synaesthetic Analogies

Concept: Creating sound-graphic equivalents.

Do: 1. Select one of the following themes: (a) jungle noises, (b) marching band, (c) bird sounds, (d) city sounds, (e) carnival, (f) demolition derby, (g) football game, (h) ocean beach.

2. Create a composition that is an abstract equivalent of the selected theme. Do not use pictures or images in this composition; rely only on lines, dots, shapes, forms, textures, colors, et cetera, to portray your ideas.

1-10 / Audio-Visual Analogies

Concept: Creating sound-graphic equivalents.

Do: 1. Record a series of sounds with a tape recorder. Include a variety of sounds such as nonsense sounds (human); sounds from gadgets and devices that are manipulated: tearing paper, crumpling cellophane, tapping objects, spilling water, sandpaper against sandpaper, et cetera; environmental sounds: automobile engines, tennis game, old pumps, street car, fire engine, et cetera.

2. Edit the sounds to produce a three minute tape.

3. Create a visual equivalent of the taped sounds. On a long strip of paper, use lines, shapes, forms, textures, colors, collage, and cut-outs from magazines to make a "graphic time-line."

23. Geometric Abstraction: The Laocöon Group by Tom Brandon, Collage. Courtesy the artist.

1-12 / Subliminal Messages

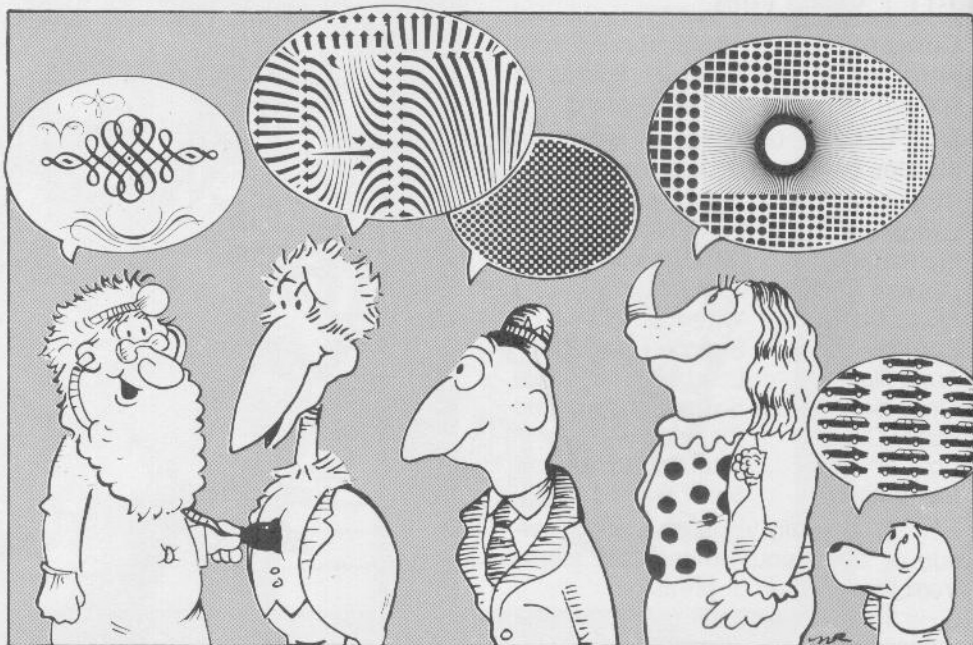
Concept: Developing awareness towards discovering hidden meanings or implications in commercial advertisements.

Subliminal images and messages are those used in advertising that exist or function outside the area of conscious awareness.

Do: 1. Collect advertisements from various newspapers and magazines.

2. Paste each ad on a sheet of large paper, allowing lots of space around each for notes.

3. Circle portions of the ad and extend lines out to the margins. Contemplate the images, the juxtaposition of images, settings, details, et cetera, and write out what the advertisers want you to believe (regardless of what the ad says). Seek out the psychological implications of the ad, the hidden meanings (subliminal messages) and inconsistencies you perceive.



1-13 / Musigram

Concept: Creating an audio-visual analogue.

Do: 1. Select a record of either classical, jazz, pop, country, or rock music to interpret.

2. Divide a large sheet of drawing paper with pen or pencil into a number of grids or compartments, corresponding to the number of cuts on the record.

3. Using only lines, shapes, textures, and colors, interpret the music by making a graphic equivalent.

4. Label the composition, along with the title for each cut.

1-14 / Speaking in "Design"

Concept: Substituting color, form, and texture for text.

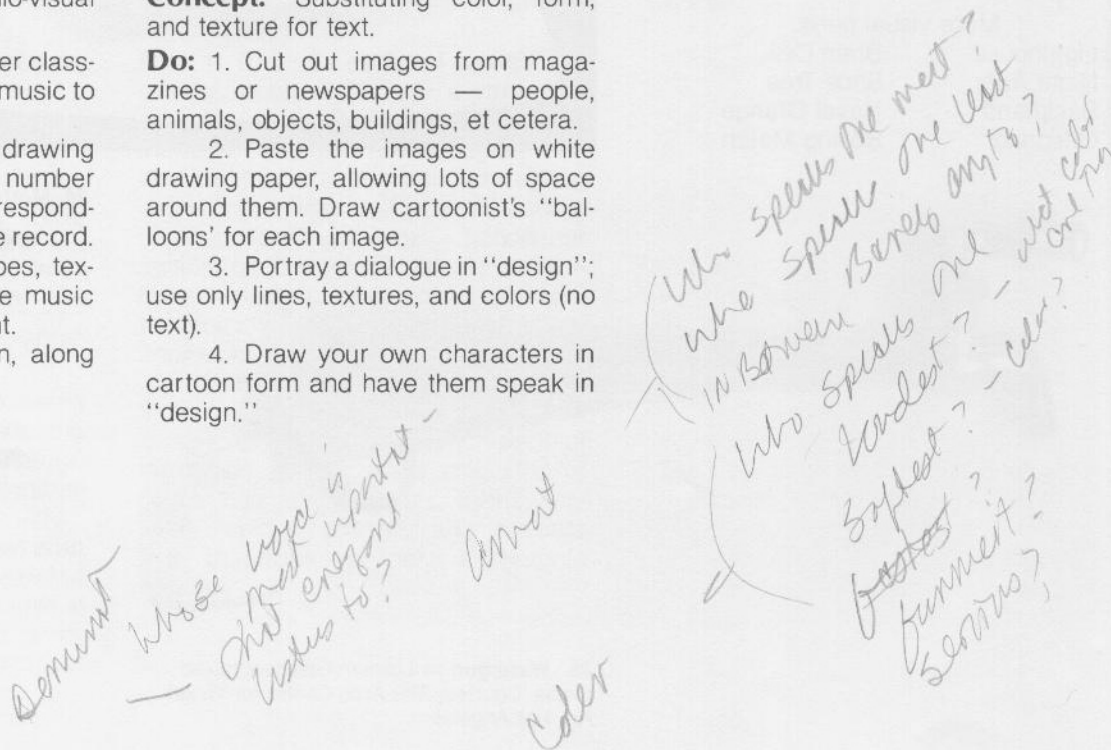
Do: 1. Cut out images from magazines or newspapers — people, animals, objects, buildings, et cetera.

2. Paste the images on white drawing paper, allowing lots of space around them. Draw cartoonist's "balloons" for each image.

3. Portray a dialogue in "design"; use only lines, textures, and colors (no text).

4. Draw your own characters in cartoon form and have them speak in "design."

26. A "conversation" in design.



1-15 / Eccentric Analogies

Concept: Developing visual imagery through "forced" comparisons.

Do: 1. Make a list of words of things, people, and phenomena.

2. Divide the list into two columns. Example:

Rain	Car
Boat	Pyramid
Earth	Unicorn
Door	Beach
Brick	Forest
City	Frying Pan
George Washington	Toothbrush

3. Arbitrarily (or with the throw of dice) connect words from one column to the other.

4. Contemplate the "forced comparison" and visualize by making a drawing, painting, collage, cartoon, or photograph.

5. Make a three-dimensional visualization of your idea with mixed media: paper, found objects, clay, wood, et cetera.

1-16 / Form/Movement Designs

Concept: Ordering information into data systems.

Do: 1. Make a design that integrates at least two different types of "information." Example:

Subject: Seagull

Data:

A. *Form:* shape, color, texture.

B. *Movement:* flight, movement patterns, etc.

2. Visual application: Make a composition that illustrates 10% of A (form data) and 90% of B (movement data)



1-17 / Anthropomorphics

Concept: Imbuing animals, plants, or objects with human qualities.

Do: 1. Use clay or pen and ink to depict one of the following situations:

- Birds on a coffee break
- Elephants at a pub
- Pencils jogging
- TV's watching TV
- Frogs at a disco
- Rocks getting married
- Cabbages listening to stereo
- Corn vs. carrots playing baseball

Add to the list and develop one of the themes with your choice of art materials.

above right: 27. Unicorn by Jonathan Meader, 1976, drawing. Courtesy the artist.

above center: 28. Elephants at a Pub by Heinrich Kley, pen and ink. Courtesy Dover Publications.

1-18 / Interview a Building

Concept: Fostering Empathic Projection.

Do: 1. Imagine how it would feel to be a particular building in your city. Visit it.

2. Make a line drawing of the building, or photograph it with a camera.

3. Paste the image of the building on a sheet of white drawing paper, allowing space around the image for cartoonist's "balloons."

4. Make up a list of questions to ask the building and print them inside the balloons. Examples:

What's your ancestry? (architectural style)

Are you married? (attached to other buildings)

Are you well organized? (efficiency of interior movement)

Can you see? (inside lighting, windows, obstructions by other buildings)

How do you get along with your friends? (architectural integration)

Can you breathe? (ventilation)

Are you comfortable? (warm/cold air control)

How's your constitution? (plumbing)

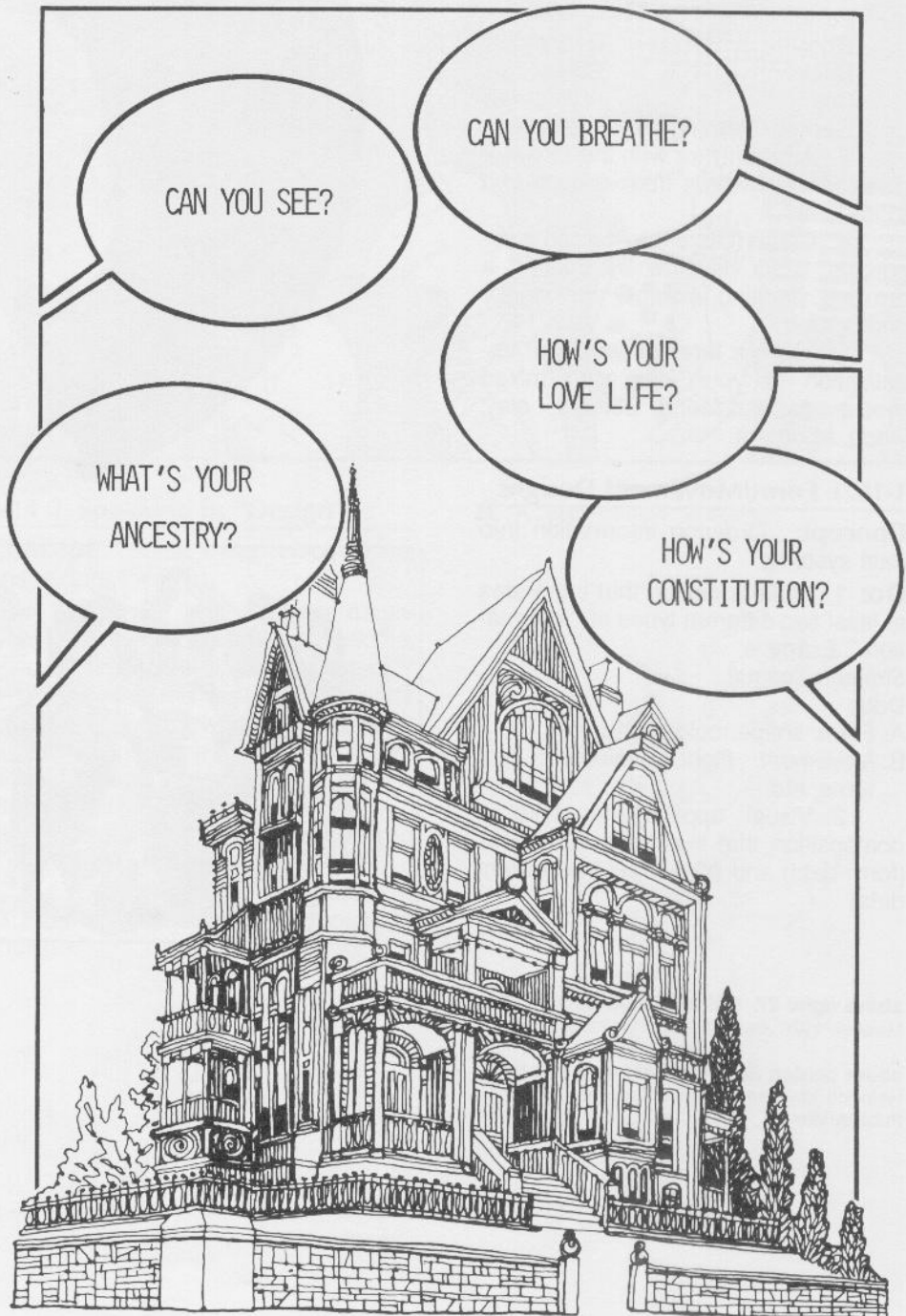
How's your nervous system? (electrical wiring)

How's your love life? (tender loving care by owners or tenants)

5. Make a tracing of the original drawing and balloons. In the second drawing, write out the building's responses to the questions (based on your research and observation).

6. Mount the two drawings together.

7. Other themes: Select another architectural object from your environment and make up a list of questions and answers. Interview a factory, bank, hamburger stand, bridge, school building, gas station, bus station, newspaper kiosk, et cetera.



29. An "interview" with a building.

CHAPTER 2

IMAGING AND TRANSFORMING

The world of reality has its limits; the world of imagination is boundless. Not being able to enlarge the one, let us contract the other.

Jean Jacques Rousseau

Man's quest for personal identity drives him in two directions: outward, into the existing world of terrestrial reality, and inward, into the subjective world of fantasy and psychic imagination. The ability to produce images is a natural human phenomenon; everyone generates mental images of one sort or another, either of a controlled or autonomous nature.

What Are Mental Images?

In *The Dictionary of Psychology*, a mental image is defined as "an experience which reproduces or copies in part, and with some degree of sensory realism, a previous perceptual experience in the absence of the original stimulation." Images can be activated through any sense perception — seeing, hearing, touching, tasting, or smelling — and can be grouped into six principal categories: (1) memory images, (2) imaginary images, (3) hypnagogic images, (4) dreams, (5) hallucinations, (6) afterimages.



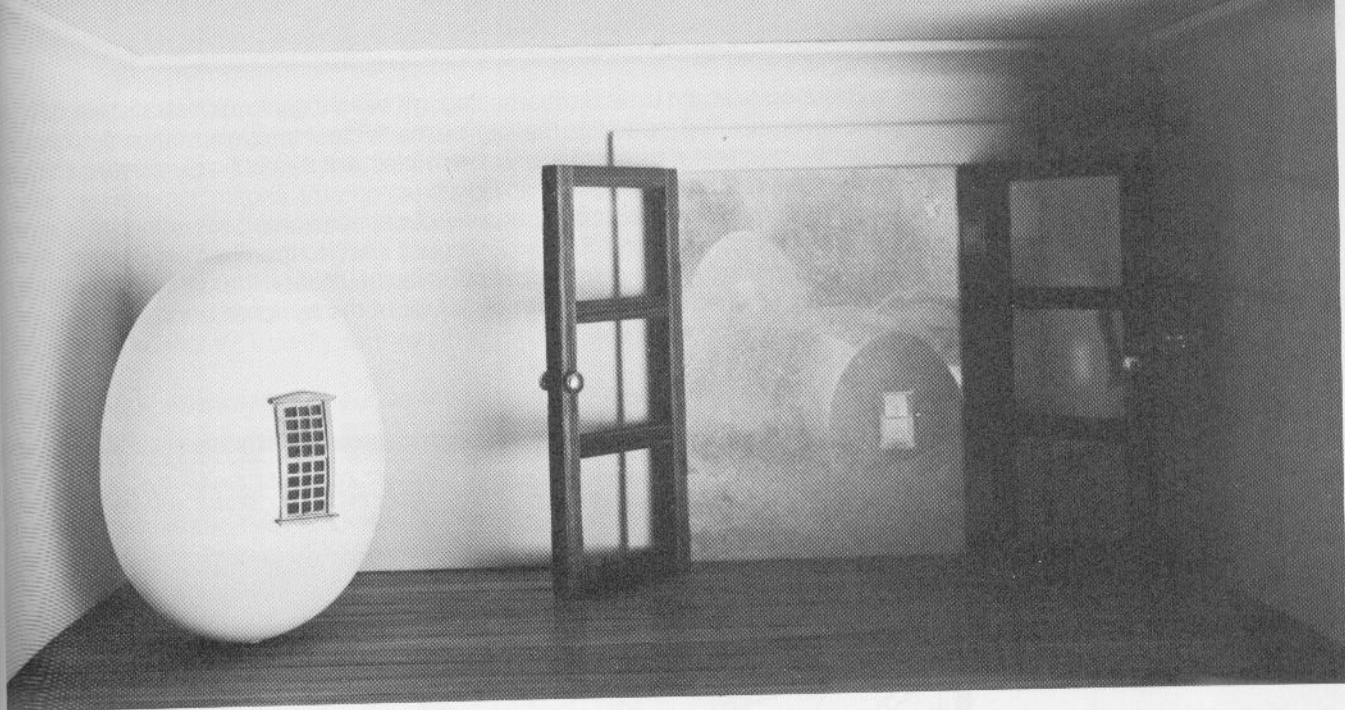
left: 30. Swami Vishnu #5 by Robert Moon, 1970, 20-1/2" x 26-1/4" (52 x 66.7 cm), lithograph. Courtesy The Museum of Modern Art, New York. The figure seemingly defies the laws of gravity as it symbolically portrays the transcendental state of mind and the tranquility achieved through the meditative states of hatha yoga.

right: 31. Portrait of Rudolf II as Vertumnus by Giuseppe Archimboldo. Courtesy Skokloster Slott, Sweden.





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Memory Images. Memory images are retrievals or recollections of past input. They are not the products of fantasy, but are simply straight-forward mental reconstructions of past experience. Our most typical visualization experience is that associated with memory. Interestingly enough, Arthur Schopenhauer defined the madman as a person who "has lost his memory." Without memory as a touchstone to reality and as a day-to-day survival tool, human beings lack a map of previous knowledge to guide them in appraising new sensations and experiences.

Imaginary Images. Imaginary images, though based on mental reconstructions of past experiences, are images that are radically *rearranged* by the subconscious. Within this realm of visualization, images are transformed by the artist's fantasy into new mental inventions. Any mental process demanding abstraction or creative thinking relies heavily on the mind's capacity to produce imaginary images.

Hypnagogic Images. Hypnagogic images are imaginary experiences usually perceived in the twilight state of consciousness between sleep and waking. In their book, *Seeing with the Mind's Eye*, Mike and Nancy Samuels describe hypnagogic images as reverie images beyond the reach of conscious control, and usually accompanied by various forms of light flashes, sparks, geometric forms, and so on. Although they may seem quite "real" to those who perceive them, hypnagogic images are internal, autonomous images.

Dreams. Dreaming is associated with that period of sleep known as the REM (Rapid Eye Movement) cycle, which is the most common generator of vividly perceived images. Each person has between three to five dreams every night, even though they may not be recalled in the wakeful state. Dreams are also internally produced autonomous images, that is, without benefit of conscious control. While dreaming, the mind conjures up strange and paradoxical images, often combining memories along with subconscious desires and anxieties. Here, the laws of space-time continuum are interrupted or reversed: the dreamer may at one moment see himself as an adult, then abruptly as a child, or suddenly as a bird in flight. While in the altered dream state, the dreamer actually believes that what is happening is "real."

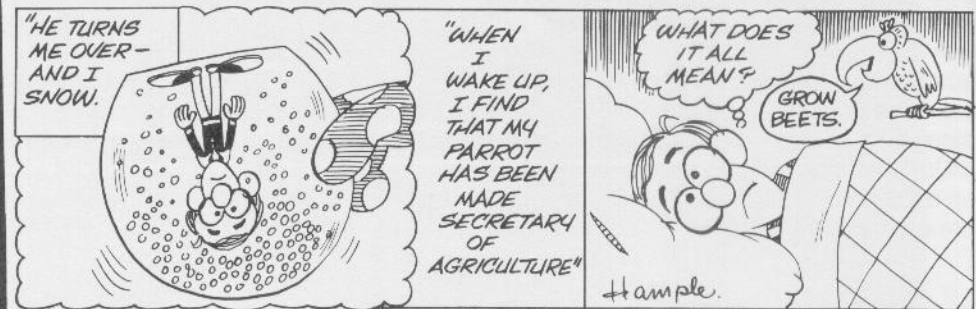
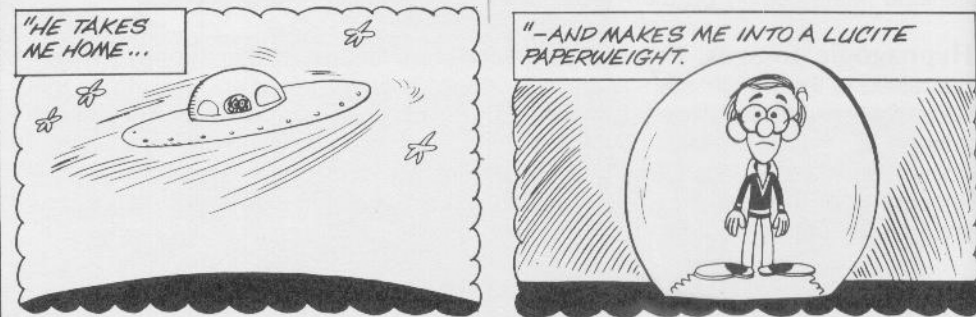
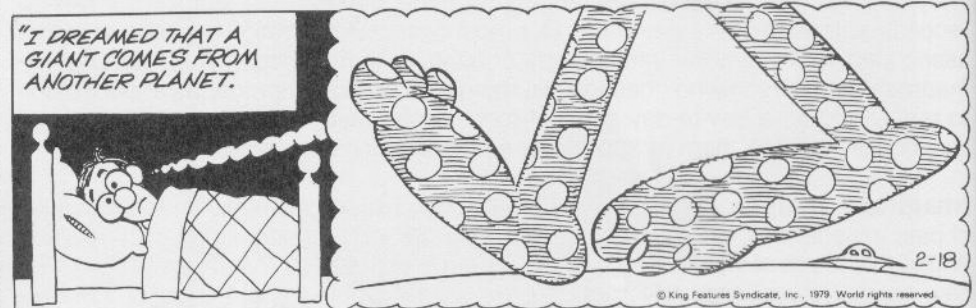
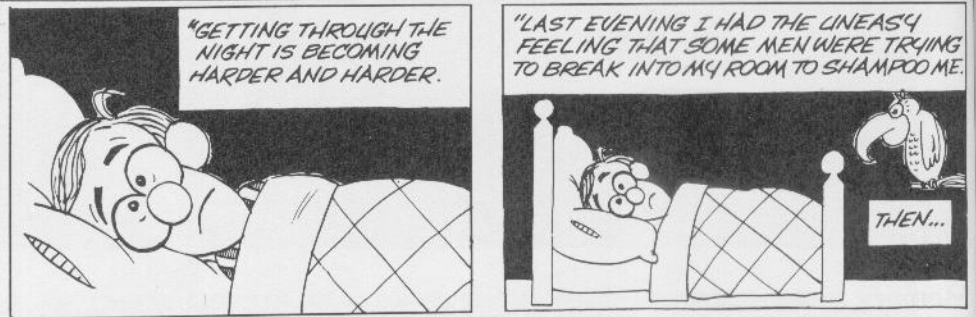
left, opposite page: 32. *The Right of Silence* by Michael Hasted 1976, 24" x 20" (61 x 51 cm), oil on canvas. Courtesy the artist. Mysteriously, a typewriter expresses ideas of nature in graphic form — an astonishing departure from its typical function.

above: 33. *Translation* by Al McWilliams, 1975, 13-1/2" x 7-3/8" x 7" (34.3 x 18.7 x 17.8 cm), wood, plastic. Courtesy the artist.

Freud has taught us that dreams, though seemingly irrational, actually do have significant underlying meanings that can be made clear through proper interpretation. In dreams, external perceptions and memories are symbolically altered and integrated into dream images.

Often dreams are sources of answers to special problems, although they may appear in a disguised form. Friedrich August Kekulé, the German Chemist, for instance, dreamed of a snake holding its tail in its mouth, and through the interpretation of this image gained insight into the structure of the benzene ring.

INSIDE WOODY ALLEN



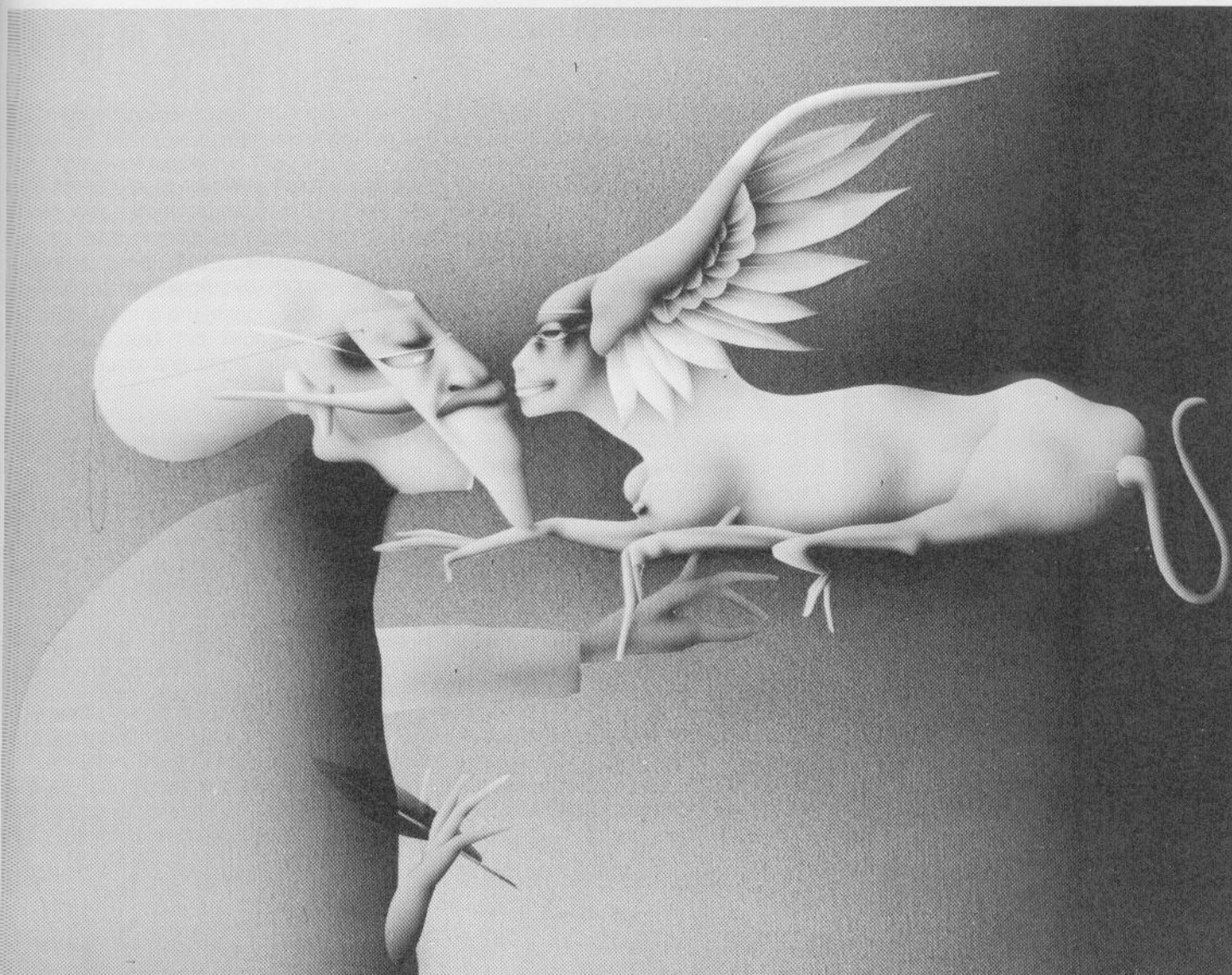
34. *Inside Woody Allen* by Stu Hample, ©King Features Syndicate, Inc., 1979, used with permission.

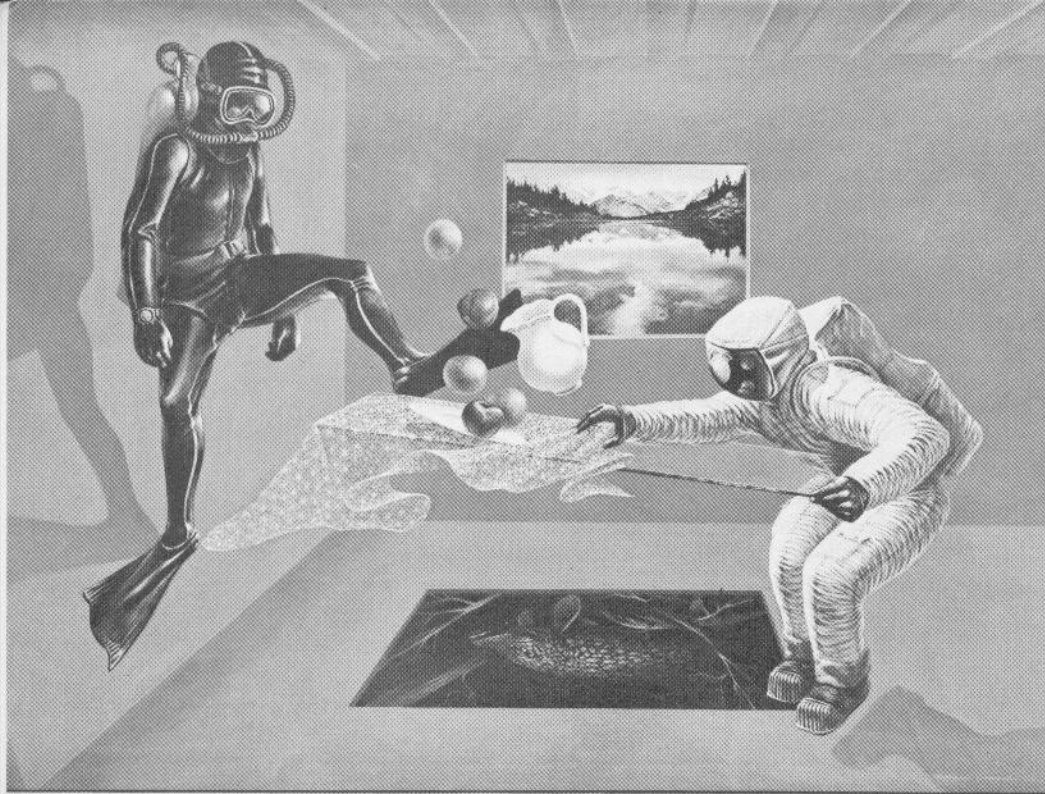
Hallucinations. Hallucinations are images perceived as a result of personality disorders or through the deleterious effects of sleep deprivation, intense concentration, meditation, or drugs. These types of images are perceived as external apparitions rather than internal images. Perceptual distortions include: blurred vision; objects appearing tilted, stretched, displaced; double vision; objects radiant with light or changed in color, et cetera. The mistaking of a bush for a bear, or a rope for a snake, is not a hallucination, but rather an illusion. However, the perception of a voice when there is no sensible acoustic vibration striking the ear *is* a hallucination. Hallucinations can be perceived acoustically, visually, or through combined sensory perceptions.

Afterimages. Afterimages occur as the result of sensory overstimulation. For example, if one stares at a bright spot for some period of time, then shifts the eyes to a white wall, a shape similar to the original subject will be perceived, but this projected image will appear reversed: that is, light colors will appear dark and all colors will appear in their complementary forms. Artists such as Victor Vasarely, Raphael Soto, Francois Morellet, Francois Yvarral, Bridget Riley, and other Op artists of the 1960s made extensive use of afterimage phenomena in their work.

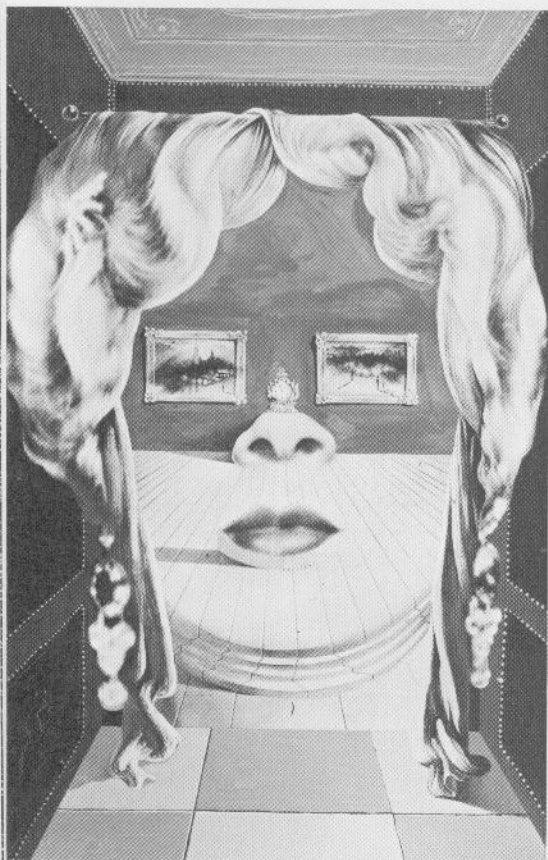
Another form of recurrent imagery may be induced when a person is subjected to a repetitive stimulus for an extended period of time. For example, an assembly-line worker in a clock factory may continue to "see" clock faces in the mind's eye long after finished working.

35. Sphinx und Todo by Paul Wunderlich, 1979, Courtesy the artist.





left: 36. Sacred Fruit by Robert Ralph Carmichael, 1973, 36" x 48" (91.4 x 121.92 cm), acrylic on Masonite®. Courtesy the artist. Laws of gravity have vanished; both spaceman and frogman share a strange topsy-turvy world.



Synaesthetic Illusion

Mental Perceptions of a multisensory mode, or the transference of one sensory perception to another, are labeled synaesthetic. For example, some few people have the capacity to see colors while listening to music, or feel certain tactile sensations while sensing particular smells. Synaesthetic descriptions are common in everyday speech: wines are described as dry, smooth, big; noises as penetrating; colors as warm, cold, loud, and so on.

Eidetics

People who have photographic memory recall are termed eidetic. They tend to produce memory images that are highly detailed and quite vivid. In some cases, the eidetic person can "see" images by simply closing his eyes, or by looking at a blank piece of paper, which functions as a convenient projection screen. In his book, *Imagination and Thinking*, P. McKellar describes one case of eidetic recall wherein a chemistry student used his eidetic powers to pass an exam: During the exam, the student "mentally opened" his chemistry book, turned to a nitric-acid diagram, and graphically transferred the diagram to the exam paper.

The possession of eidetic recall, however, does not guarantee a creative intellect. Without a correspondingly active brain capable of generating imagination images, eidetic people may be quite ordinary in their creative capacity.

37. Mae West by Salvador Dali, 1934, 11" x 7" (27.9 x 17.8 cm), gouache. Courtesy Art Institute of Chicago, gift of Gilbert W. Chapman.

Creative Imaging

We know that creativity is a brain function. But exactly *how* the brain functions during its creative phases is still largely a mystery. It seems, however, that the creative imagination operates by the interplay of several key functions: (1) *synthesis*, the mind's ability to form unified patterns out of the chaotic input and multiplicity of stimuli; (2) *simplification*, its ability to reduce complexities to essences and basic elements; (3) *detachment*, the disassociation of leftbrain thinking that allows insights to occur from the more intuitive rightbrain; (4) energizing, activating the mind towards making new connections, reassociations, and modifications.

The French Mathematician, Jules Henri Poincaré, likened the mind's search for creative solutions to that of the interaction of atoms: "They plow through space in all directions . . . their mutual collisions may produce new combinations." He also stressed the importance of the *prepared mind*, however, and viewed the conscious mind (with its acquired skills and knowledge) as the prod that liberates the fixed structures of the unconscious so they can move toward new combinations.

Other writers have described the creative operations of the mind as a function of these processes: preparation, incubation, illumination and verification.

For further reading on this subject, consult Alex F. Osborn's authoritative text, *Applied Imagination*, published by Charles Scribner's Sons, New York.

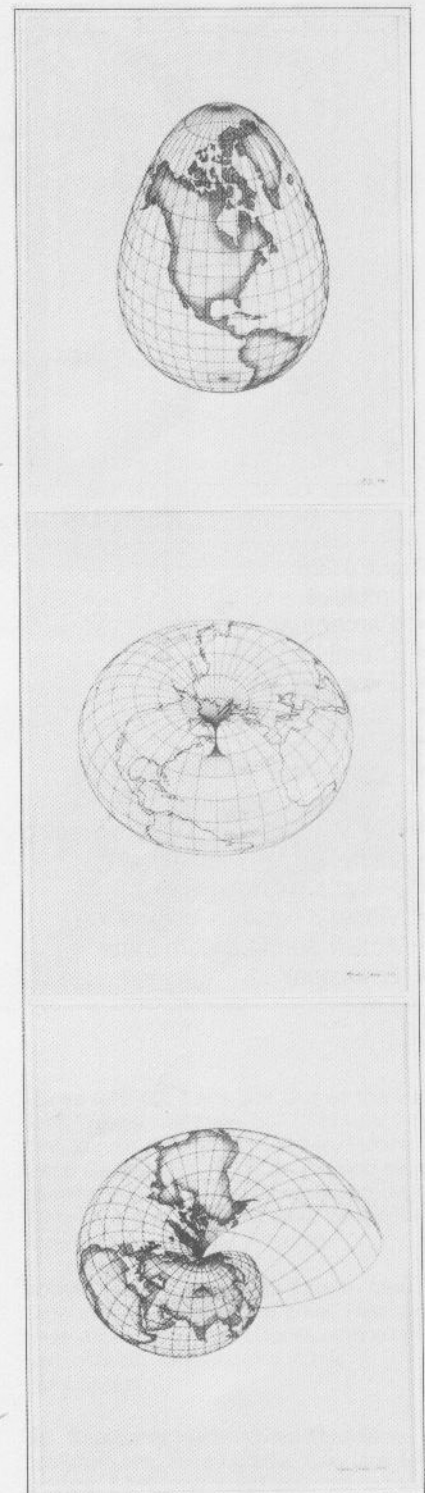
The Split Brain

Neurophysiologists today claim that the cerebral cortex of the human brain is in reality *two* brains — composed of the left and right hemispheres — each having distinctly different functions. They interact through interconnecting fibers known as the corpus callosum. Although the two hemispheres of the brain seem to have equal potential to perform all mental functions, each has its special operations. The right part of the brain controls the left part of the body and vice versa. The left brain controls rational, analytical thinking, language skills, mathematical functions, and sequentially ordered thinking. The right brain, on the other hand, controls intuitive functions, spatial orientation, spatial constructions, crafts, skills, art, music, creative expression, and the recognition of images. The right brain processes data simultaneously and more diffusely than the left, tending to evolve holistic mental patterns.

Research psychologist Robert Ornstein suggests that because of the brain's special makeup, there are two major modes of consciousness that simultaneously coexist within each person: the rational and the intuitive. Supporting this hypothesis is Anton Ehrenzweig, author of *The Hidden Order of Art*, who states that the coordinated efforts of *unconscious* mental scanning, combined with *conscious* differentiation allows the artist to bring forth to the surface the "hidden order of the unconscious." This coordinated mental activity should be considered a "precision tool" for creative thinking, and should be nurtured by practice and application.

Thus, creative imagination involves more than just having images in the mind's eye; it is a process of *sensing relationships between diverse elements*, which results in the formation of new and unexpected metaphors. As Jean Paul Sartre wrote, "the imagination gives clarity to perception." In itself, imagination is not constructive. Only when the products of imagination and fantasy are linked with conscious perception and deliberation does formative thinking and creative vision emerge.

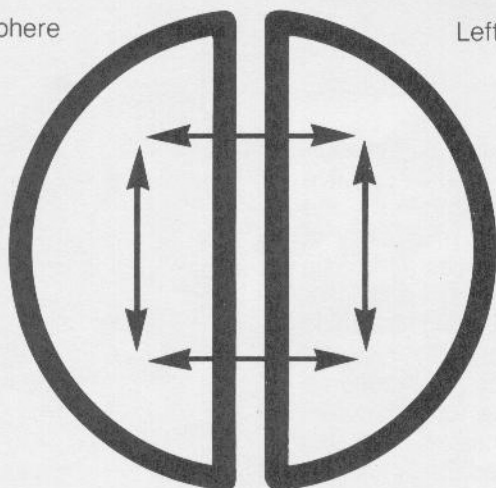
Intuition, the process of subjectively sensing insights without benefit of rational thought, is a natural and subconscious form of intelligence. However, when rational intelligence is used to "nail down" intuitions into objective perceptions, they cease being intuitions and become absorbed into the patterns of conscious experience.



38. Earth as Egg, Donut, Snail by Agnes Denes, 1974, ink and charcoal on graph paper. Courtesy the artist.

Right Hemisphere

Left Hemisphere



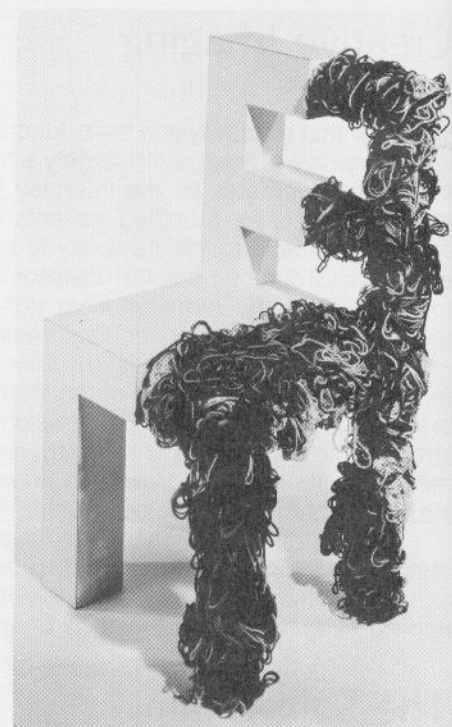
Right/Left Brain Functions

Right Brain

- Intuitive
- Perceptual
- Creative
- Experiential
- "Felt-Thought"
- Spatial
- Associative (pattern recognition)
- Simultaneous mental processing
- Diffuse mental processing
- Holistic associations
- Visceral-nervous control
- Active during dream state
- Emotional

Left Brain

- Intellectual
- Rational
- Analytical
- Verbal (language skills)
- Computational (mathematics, detail, codification)
- Sequential mental processing (linear thinking)
- Routinization
- Musculoskeletal control
- Orthodox
- Quiet during dream state
- Reason

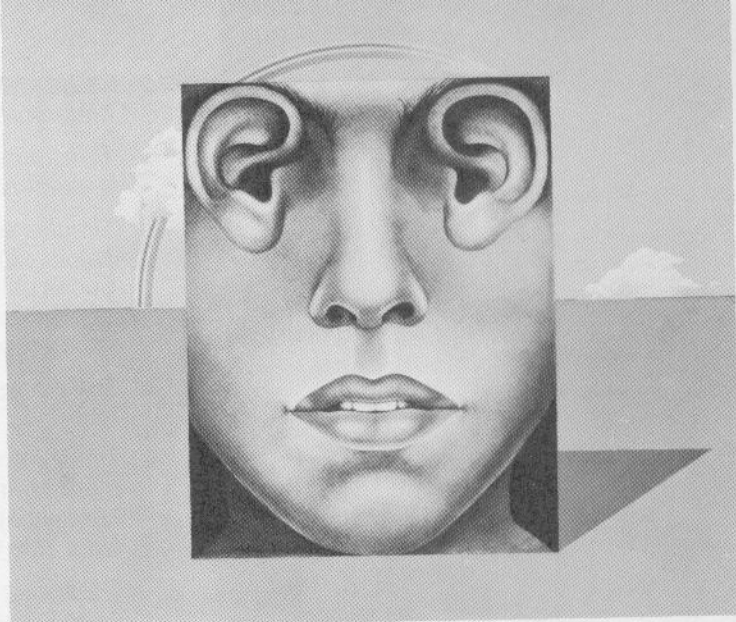
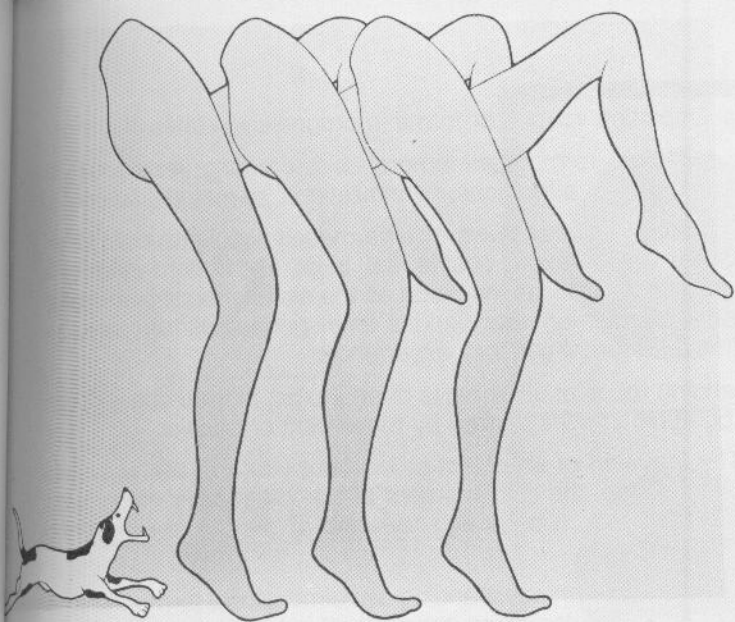


above: 39. Chair Transformation by Lucas Samaras, 1970, 38" x 20" x 20" (96.5 x 50.8 x 50.8 cm), white Formica and colored yarn. Courtesy Pace Gallery, New York.

Mobilizing Creative Thinking

The following attitudes and activities seem to be necessary to creative thinking, and have been observed in all truly creative people regardless of profession.

- The training and practice of activities that largely involve rightbrain functions.
- Suspension of judgment; making disconnected jumps in thinking (lateral thinking).
- Openness to new stimuli, new ideas, new attitudes, new approaches.
- Willingness to take risks; making "leaps of faith"; lessening inhibitions.
- Freedom in subjective thinking; expression of emotions and personal realities.
- Intuitiveness, "playing hunches" to generate spontaneous ideas.
- Freedom to make outlandish responses; rejecting fear of being "wrong" or unconventional.
- Rejecting destructive criticism, prejudices, indiscriminate praise.
- A childlike attitude of creative play; tinkering with ideas, materials, structures; a "fun" attitude toward experimentation.
- Freedom to fantasize, unconventional imagining.
- Divergent thinking; simultaneous processing of ideas; fluency of ideas.
- Acceptance of nonordinary realities, contradictions; ability to tolerate and manipulate puzzles, ambiguities.

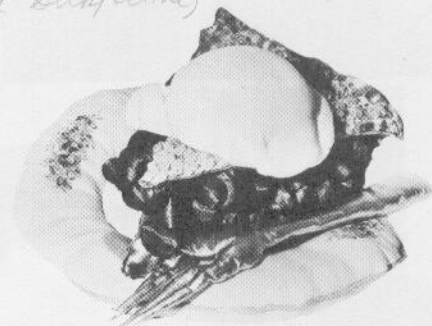


*rate as to degree of creative difficulty/promises?
(it would be subjective)*

Transformation: Operational Techniques

How do artists do it? What are some of the underlying methods, techniques, and pictorial devices used to transform ordinary subjects and visual perceptions into uncommon, extraordinary, fantastic ones? Study the works of modern and traditional artists for this purpose. Here are eighteen ways that have been used successfully and continue to be part of the artist's repertoire:

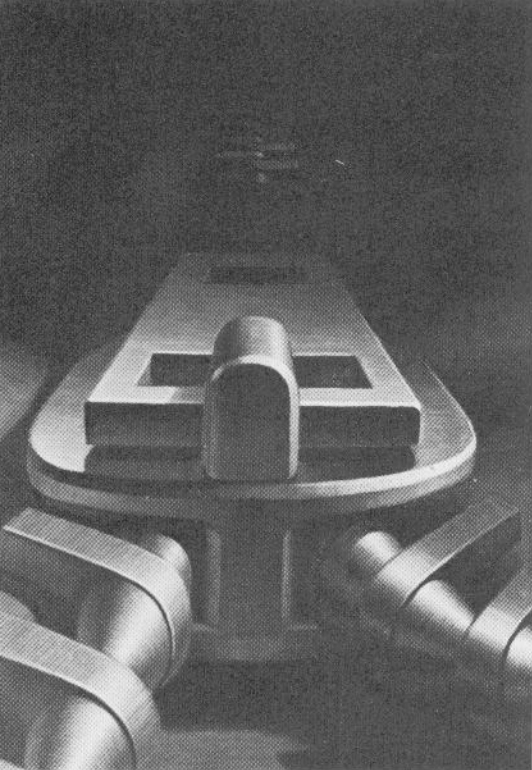
1. **Magnification:** The "reconstruction" of a subject on a much larger scale than that of the original; for example, a pencil sharpener, eight feet high as a subject for sculpture.
2. **Minification:** Making an object appear smaller; for example, an "art museum" created the size of a shoe box.
3. **Multiplication:** Repeating images or forms within a composition, a grid structure, a kaleidoscopic pattern, in reflected images, et cetera.
4. **Substitution:** Changing the original qualities of objects and surfaces: a "soft" telephone, a "wooden" lightbulb, a "concrete" pillow, et cetera.
5. **Reversals:** Reversing color, perspective, functions, relative sizes and so on; reversing the "laws of nature," such as gravity, et cetera.
6. **Fragmentation:** Splitting or fragmenting objects or images. The subject may be either partially developed, fragmented, or dismembered. Splitting planes, as in Cubist art.
7. **Partial Delineation:** Drawing, carving, or presenting only a portion of an image in its finished state; depicting an image emerging or becoming engulfed in its environment — Michaelangelo's unfinished *Slaves*, for example.
8. **Distortion:** Changing an object or image by deformation, distortion, or progressive states of degradation: burned, dissolved, decomposed, crushed, cracked, et cetera.
9. **Disguising:** The use of latent or hidden images; obscuring the qualities of an object by wrapping, masking, or camouflaging.



above left: 40. Let's Get Out of the Hall by John Wesley, 1971, 36" x 47" (91.4 x 119.4 cm), acrylic on canvas. Courtesy Robert Elkon Gallery, New York. An isolated set of dancing legs is chased by a barking dog. Through use of fragmentation, Wesley has created a paradoxical situation.

above right: 41. Eyes As Ears by Ute Osterwalder, Courtesy the artist. Relocating anatomical features produces both surreal and symbolic associations in this composition.

42. Blueberry Pie by Vivien Thierfelder, soft sculpture with mixed media. Courtesy Alberta Culture, Edmonton. Lush satin berries in a glass beaded crust are topped with a dollop of nylon stocking vanilla ice cream.



10. *Metamorphosis*: Depicting images or forms in progressive states of change.
11. *Transmutation*: A radical form of metamorphosis; creating Jekyll-and-Hyde transformations, mutations, alterations, hybridizations, re-materializations.
12. *Simultaneity*: Presenting several views or time modes simultaneously; for example, simultaneous presentations of side, top, back, and bottom views, as in Cubist painting; temporal dislocations, such as the simultaneous presentation of childhood and adult memories or various time-space situations; simultaneous presentation of different sensory experiences.
13. *Soft Focus*: Changing focus of all or parts of an image; blurred edges or contour lines; photographic images blurred by movement or panning.
14. *Transference*: The intrusion of an object or element into a space or environment not normally its own; the displacement of an object or elements into a new situation. For example, a huge egg towering above the skyscrapers of New York City's skyline.
15. *Collapsing Volume*: (or vice-versa: expanding two-dimensional forms into three-dimensional objects): Rendering three-dimensional subjects to appear flat or transparent, through the use of contour line, silhouette, transparent planes, et cetera. And the reverse: a well-known painting interpreted as a three-dimensional form.
16. *Animation*: Inanimate subjects can be made "to come to life": organic or inorganic subjects can be given human qualities. Functions can also be implied through image repetition and progression; for example, overlapping silhouettes of scissors in various open and closed positions to suggest "cutting."
17. *Progressive Image Breakdown*: Subjecting an image to treatment that tends to deteriorate, obscure, or progressively break it down to simple shapes or patterns: using translucent collage overlays to obscure images; sequential color photocopying to break down detail; gridding and transforming; computer serialization; et cetera.
18. *Positive-Negative Reversal*: Using the photographic negative rather than the print (or *both*) in a composition; using female molds or *concave* shapes to abstract figurative sculpture (as in the work of Alexander Archipenko and Cubist sculptors).

above left: 43. Zipper II by Leonard Kocianski, 1979, 41" x 29" (104 x 73.6 cm), pastel on paper. Courtesy George Belcher Gallery, San Francisco.

44. Metronome by Andre Peterson, 1975, 30" x 30" x 72" (76.2 x 76.2 x 182.8 cm), Birch, Oak. Courtesy the artist.

2

ACTIVITIES

2-1 / Eidetics

Concept: Strengthening visual recall.

Do: 1. Contemplate the images on the grid (right) for one minute.

2. Close the book. On a piece of paper, draw the grid and the images in their correct positions.

3. Create a visual recall exercise of your own.

2-2 / Visualization

Concept: Sharpening abilities to form mental images.

Do: 1. Look at the image of the black circle on the white background for one minute.

2. Cover the image with white paper. Imagine the black circle in your mind's eye.

3. Imagine the circle splitting in half vertically, producing two half-circles.

4. Imagine the two black half-circles suddenly turning a brilliant orange with white polka dots.

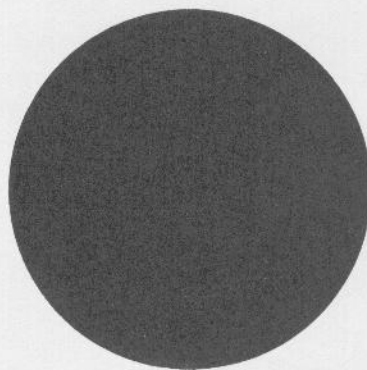
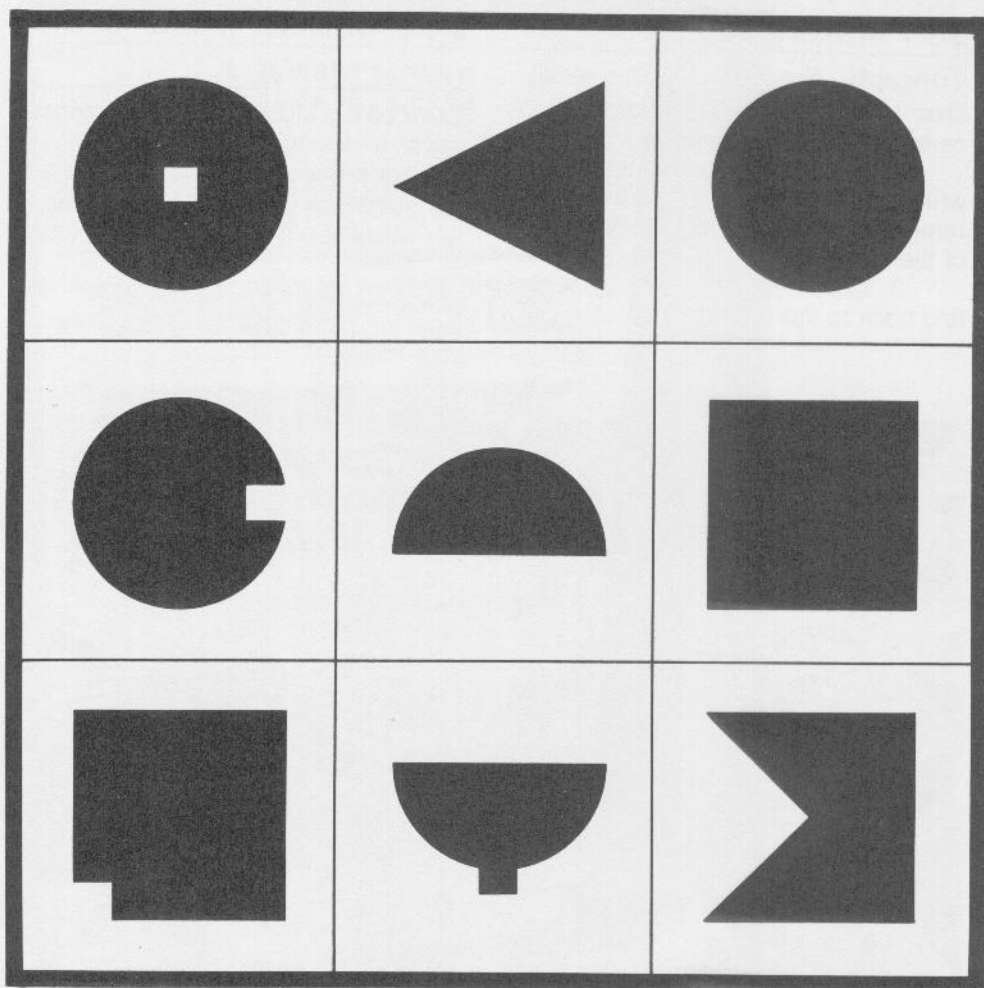
5. Imagine the half-circles turning into the wings of a butterfly.

6. Imagine a butterfly with wings of bright orange and white dots — and a black shiny body.

7. Imagine the butterfly flying away.

Rate yourself: Images were very clear (C), vague (V), indistinct (I).

8. Create an imagination exercise of your own.



above: 45, 46. Eidetic exercises for strengthening visual recall.

2-3 / Memory Test

Concept: Sharpening eidetic recall.

Do: 1. Study an art reproduction carefully for three minutes.

2. Remove the reproduction and write down as many details as you can remember regarding the components of the composition.

3. Check your memory by referring back to the reproduction.

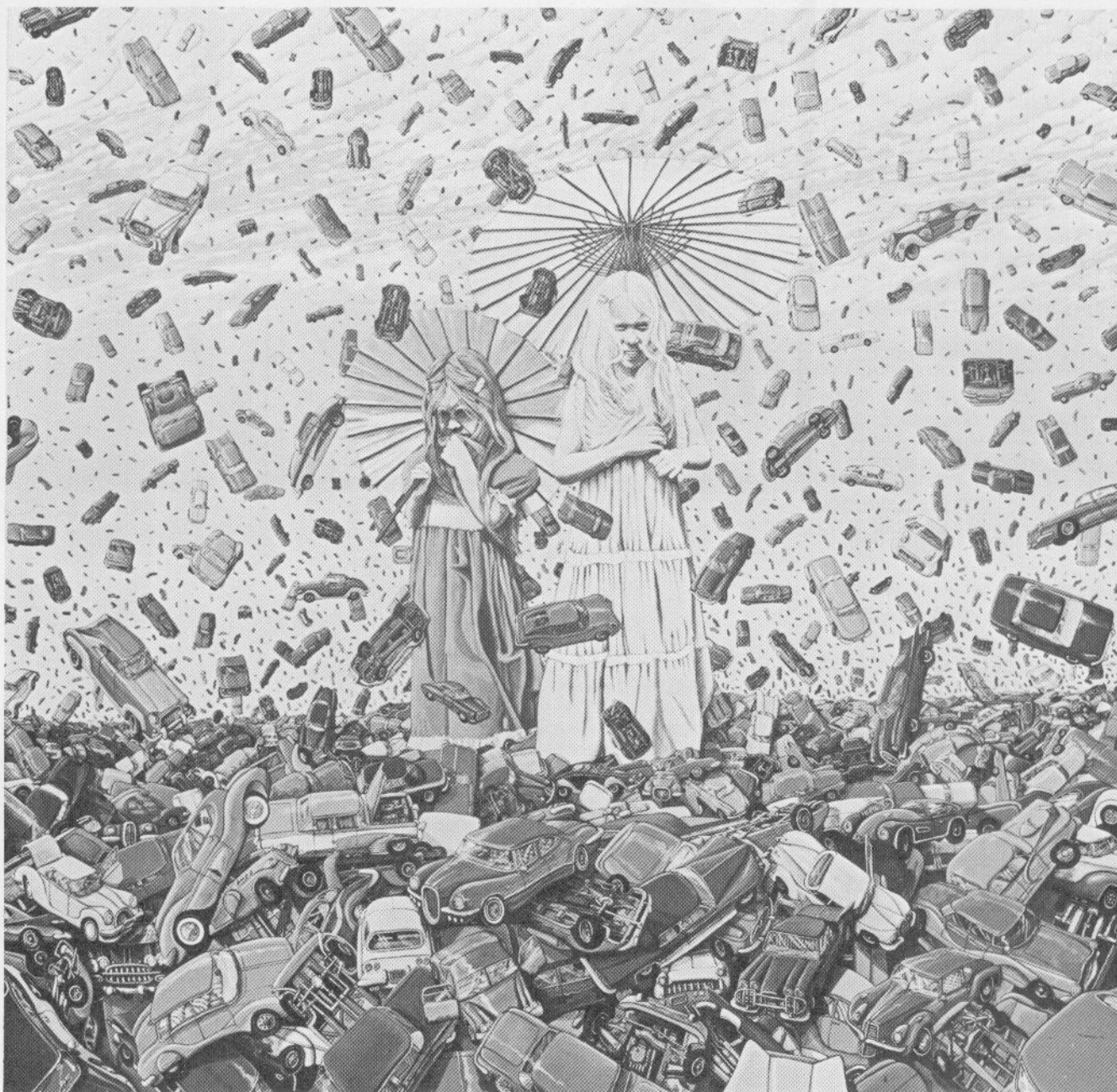
2-4 / "Wouldn't it be a strange world if . . ."

Concept: Mobilizing fantasy; arresting or reversing "laws of nature."

Do: 1. Make up a list of 10 "impossible situations" based on your reactions to "Wouldn't it be a strange world if . . ."

2. Make a drawing, cartoon, collage, or painting that depicts one of your ideas.

47. Raining Cars by Randall Rosenthal, acrylic. Courtesy Galerie Jasa, Munich. Wouldn't it be a strange world if suddenly it rained cars? With poetic license the artist does the impossible: commonplace objects are juxtaposed to create strange, surreal environments.



2-5 / Selected Segment

Concept: Searching for design with a viewfinder.

Do: 1. Select a commonplace object as a subject for this composition — scissors, key case, egg beater, pliers, key ring, stapler, et cetera.

2. Cut out a viewfinder from cardboard or heavy paper. (Make the window much smaller than the overall size of the object.)

3. Scan the object for an interesting compositional segment.

4. With the viewfinder in place over the object, draw an enlargement of the selected segment.

2-6 / Minification

Concept: Changing perceptual responses to a subject through miniaturization.

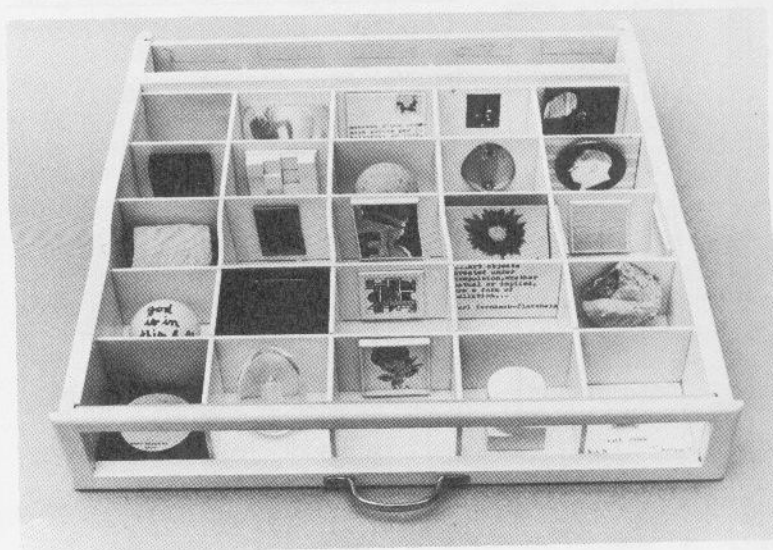
Do: 1. Make a miniature art museum.

2. Collect images from magazines and interesting three-dimensional objects for the "collection" of your museum.

3. Subdivide a small chest of drawers or other appropriate containers to act as the museum.



48, 49. Miniature Museum of Modern Art
by Herbert Distel, 1970. Courtesy the artist.
This miniature "art museum" has a collection of *objets d'art* carefully arranged within the cells of each drawer.



2-7 / Impossible Realities

Concept: Sharpening ability to form mental pictures.

Do: 1. Visualize the following structures in your mind's eye:

A chair made of Ping-Pong balls.
An automobile made of postage stamps.

A flower made of pencils.

A human head made of clouds.

A hand made of marbles.

A telephone made of ears.

A truck made of lips.

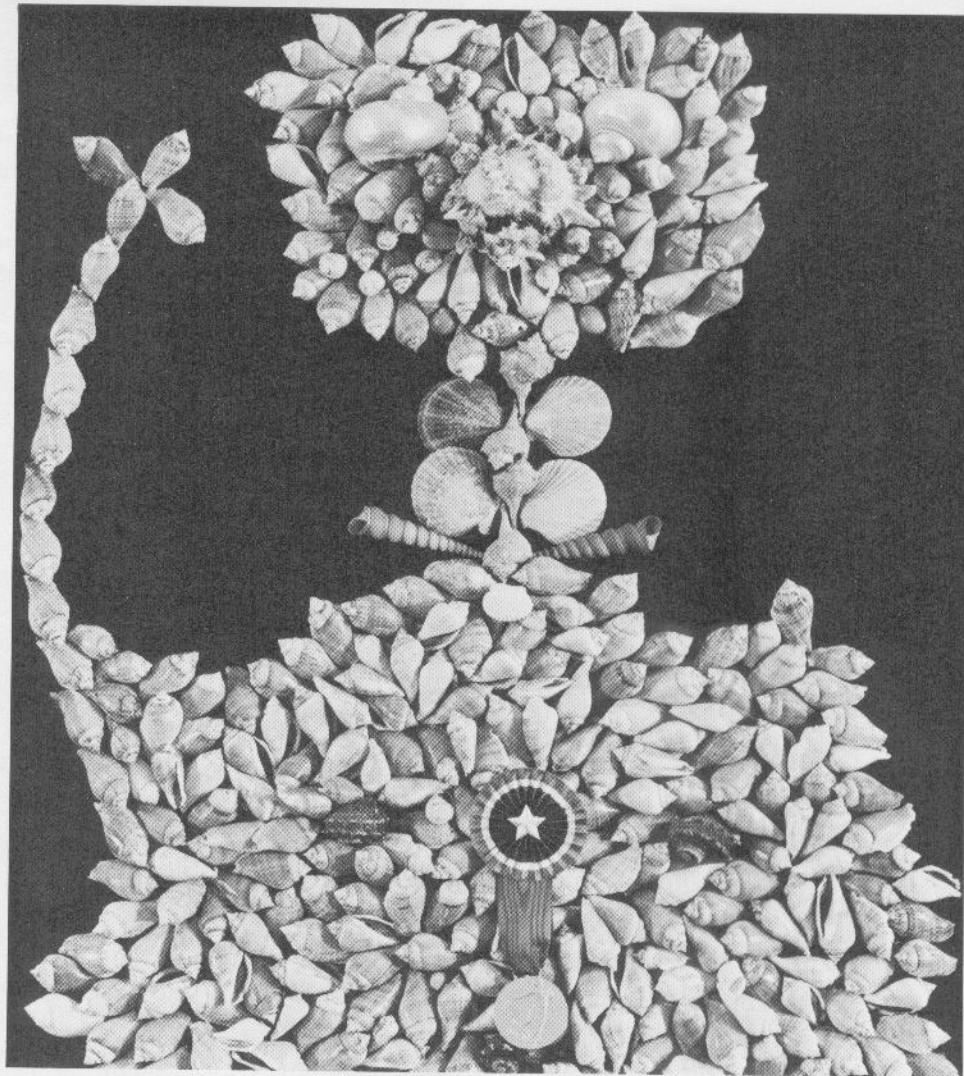
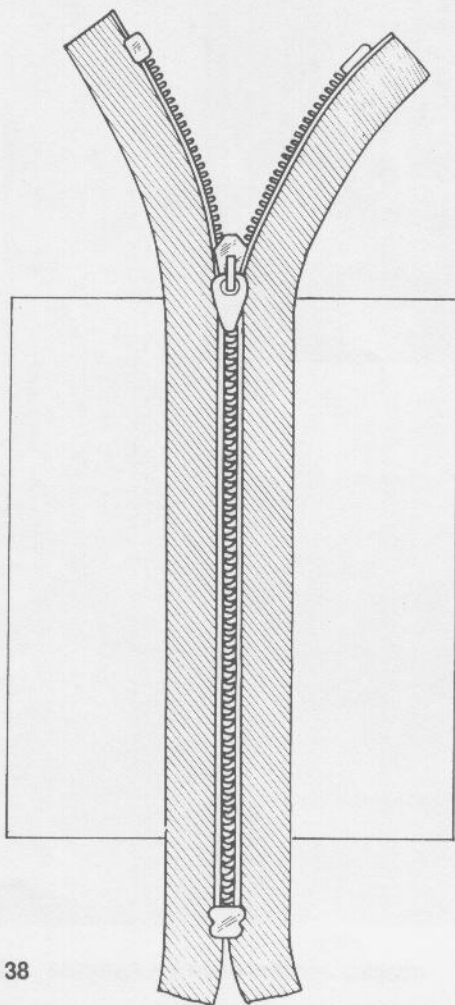
A table made of flowers.

A human figure made of eyes.

2. Rate yourself according to the clarity of your imagery: (C) clear, (V) vague, (I) indistinct.

3. Make up a list of 10 additional "impossible realities."

4. Project assignment: Choose one theme from the group and realize it in tangible form by creating a collage, drawing, bas-relief design, or sculpture.



2-8 / Mental Imagery

Concept: Sharpening ability to form mental pictures.

Do: 1. Contemplate the image to your left. (Turn the page any way you like.)

2. Mentally transform it into another subject.

3. Place tracing paper over the image and carefully trace it. Draw additional lines to transform it into something radically different. (Make three different transformations from the same subject.)

4. Find other images of commonplace objects from books or magazines and create additional transformations.

above: 50. Catherine Henriette De Balzac
by Enrico Baj, 1978, shells, mixed media.
Courtesy Arras Gallery, New York.

left: 51. An image for visual transformation.
What can it become?

Image + Content

2-9 / Animated Object

Concept: Imbuing inanimate objects with human characteristics.

Do: 1. Find an interesting discarded object: an old radio, steam iron, telephone, tea kettle, et cetera.

2. Add features: eyes, nose, mouth, ears, hair, and so on, using wadded paper and masking tape, plasticine, jar lids, eyeglass frames, et cetera.

3. Cover with papier-mâché (or J-cloth): cut paper into small pieces; dip into an equal mixture of white glue and water; build up in three to five layers.

4. Decorate with acrylic or tempera paint.



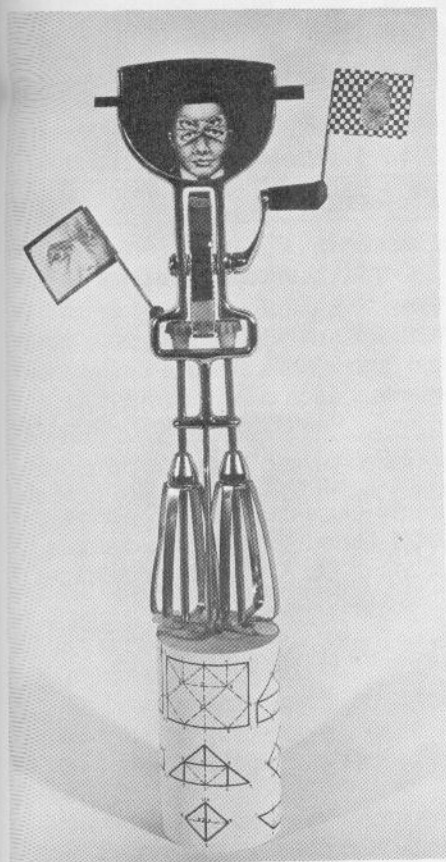
2-10 / Transforming Derelict

Objects

Concept: Creating an aesthetic object from an abandoned derelict.

Do: 1. Find an interesting object from the garage, attic, flea market, auction, or second-hand store.

2. Transform the object by covering its entire surface with textural materials: mosaic, pebbles, glass, mirrors, feathers, flocking, yarn, paper, sand, photos, rope, coins, marble or granite chips, smaller objects, et cetera. Do this by using white glue: spread glue on the surface, then sprinkle fine-particled materials such as sand, marble dust, or sawdust on it. (Use tile cement to attach heavier materials: butter cement to surfaces, then press pebbles, buttons, or tiles to the surface.)



52, 53. **Transformations** by George Geros, mixed media. Courtesy the artist.

2-11 / Transformation in Nature

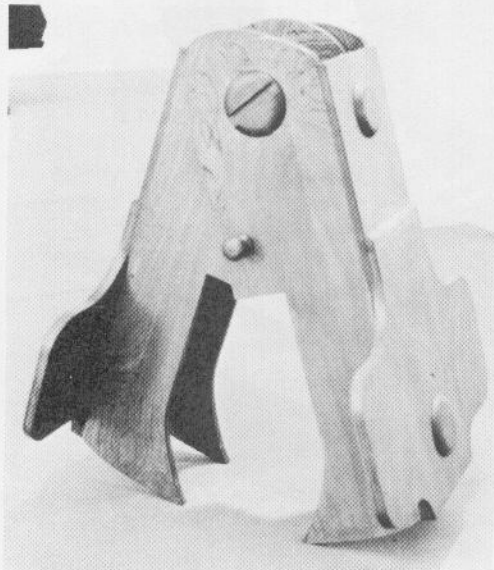
Concept: Documenting a radical transformation of an environmental object.

Do: 1. Select an outdoor subject or a specific marked-off section of landscape for this study; for example: a tree — a building — a small landscape: a 12" square section of sandy beach — a pebbled landscape.

2. Photograph the same subject three times, making each photo radically different from another due to different environmental conditions brought about by nature or man; for example: light-dark, dry-wet, dry-icy, dry-snow, before-after, radical demolition or alteration, et cetera.

3. Mount the three photographs next to each other on a sheet of mat board.

54. Staple Remover by Andre Peterson, 1975, 30" (76 cm) high, Ash. Courtesy the artist. Architectural-size exaggeration of small objects radically affects perceptual responses; small objects are no longer seen in their utilitarian role.



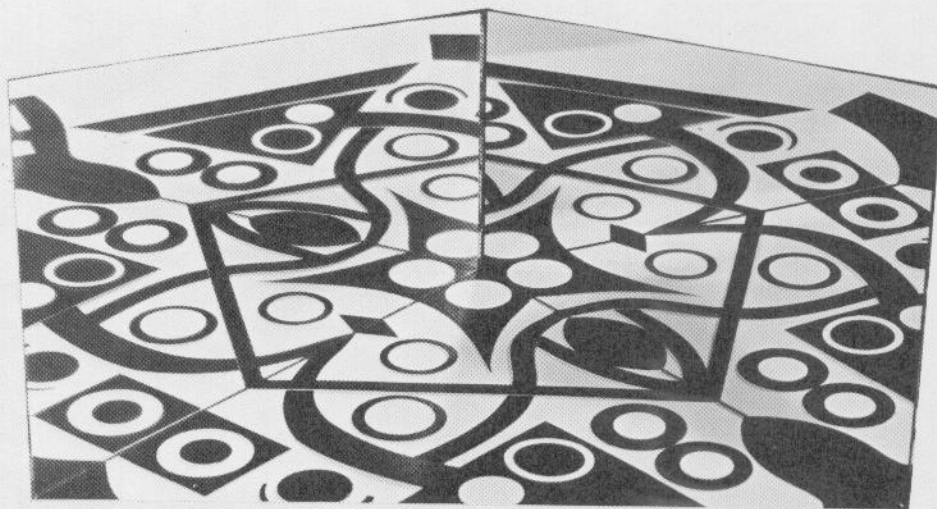
2-12 / Magnification

Concept: Changing perceptual responses to an object by making it larger.

Do: 1. Select a subject for your composition that is normally quite small, such as a paper clip, nail clipper, wrist-watch, corkscrew, electrical or mechanical parts, bugs or other small creatures, et cetera.

2. Recreate the subject on a giant scale: Make a soft sculpture by cutting fabrics and flexible materials, which are then sewn, stuffed, stitched, and decorated; or create a large rigid structure by using cardboard and tape.

55. Two mirrors are taped together to act as an aid for discovering symmetrical design patterns.



2-13 / Kaleidoscopic Patterns

Concept: Creating design through multiplicity.

Do: 1. Tape two 12" x 12" mirrors together so they open like a book.

2. Place the mirrors over various designs you have drawn and study the symmetrical variations that are created by manipulating the mirrors.

3. When a desired composition is achieved, trace the portion of the design between the mirrors on acetate with a felt marker.

4. Make additional tracings of the pie-shaped design on acetate to complete the kaleidoscopic pattern. (Note: every other design will have to be reversed to duplicate the mirror reflection.)

5. Enlarge the design with the aid of an overhead projector, and project it onto a large sheet of butcher paper taped to the wall.

6. Render it in acrylics, tempera, or mixed media.

2-14 / Three-Dimensional Projections

Concept: Projecting images and patterns on three-dimensional objects.

Do: 1. Select a number of still life subjects: bottles, kitchen pots, boxes, old shoes, discarded musical instruments, beach balls, et cetera.

2. Paint them white with acrylic gesso.

3. Project 35mm slides of extreme close-ups (butterfly wings, subjects filmed through microscopes, or slides of Op Art) on to the surfaces of these objects.

4. Draw, paint, or photograph the resultant combination.

*Context
to get to context
usually need
mass or
context*

2-15 / Mutant Fruits

and Vegetables

Concept: Transforming the appearance of fruits and vegetables. Imagine that some strange, unaccountable force (cataclysmic but not catastrophic) has altered the life-giving rays of the sun and the mineral content of the earth.

Do: 1. Imagine what might be the biological and/or physical effects of fruits and vegetables that are grown in the garden of this changed environment.

2. Using clay, handbuild four mutant fruits or vegetables that reflect this phenomenon. Bisque fire and paint with acrylic. (David Furman)

2-16 / Re-Materialization

Concept: Depicting metamorphosis of an object's surface texture.

Do: 1. As a subject for this composition, select two objects: (a) a commonplace object, (b) another object with pronounced surface texture.

2. Make a detailed outline drawing of the first object.

3. Instead of rendering it with its original texture, render it with the texture of the second object; for example: an electric light bulb that appears to be made of wood.

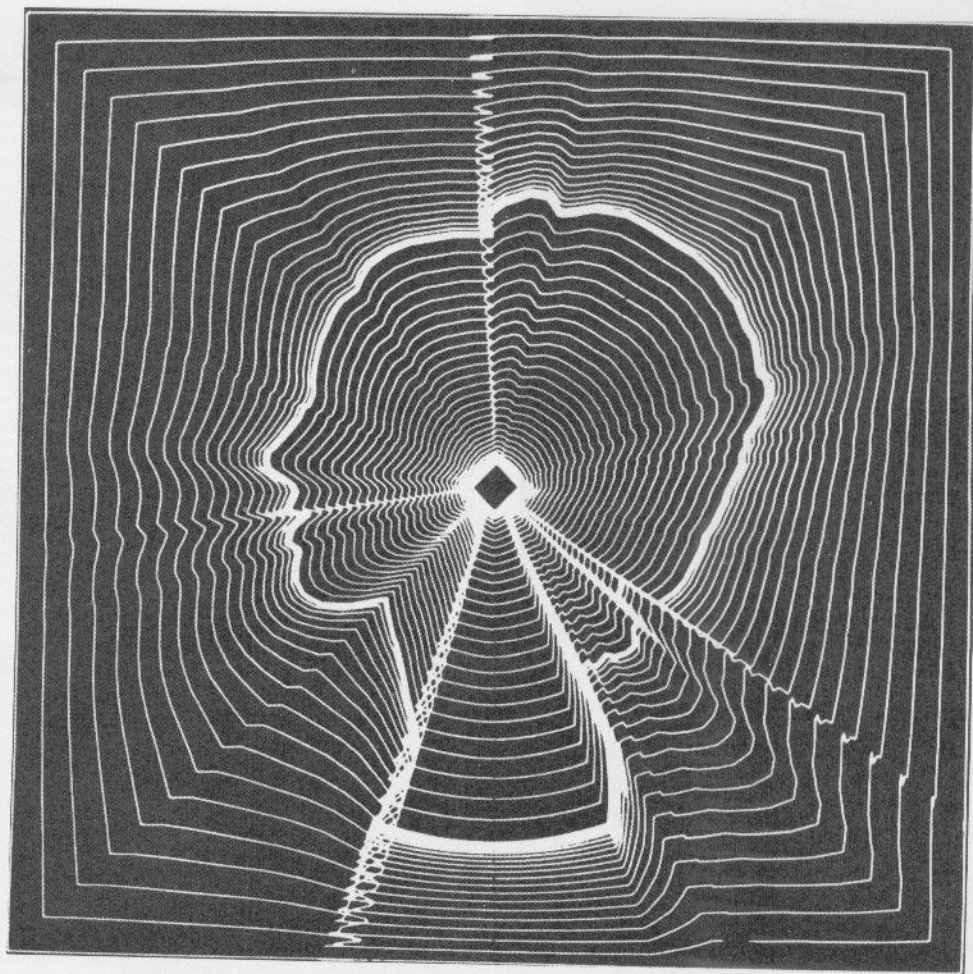
2-17 / Growth Patterns

Concept: Creating designs portraying progressive states of growth and transformation.

Do: 1. In the middle of a 9" x 12" piece of drawing paper, draw the outline of a basic shape — circle, triangle, square, et cetera — or the silhouette of a recognizable object.

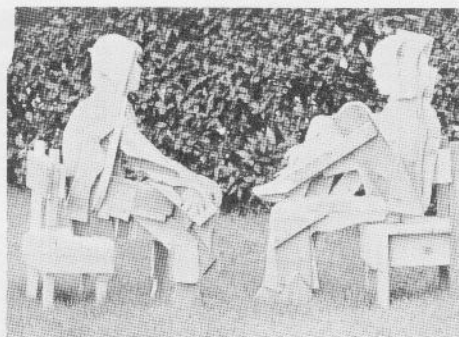
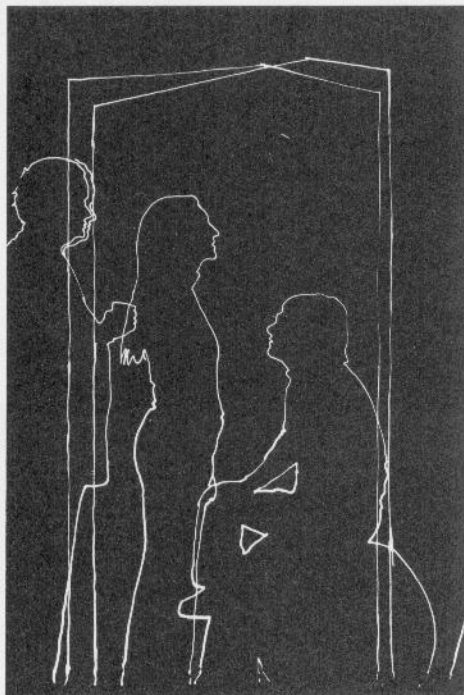
2. Draw another line around the original drawing, following the general contours but showing some slight evidence of transformation.

3. Continue drawing additional outline shapes around each preceding drawing, developing a progressive growth pattern from the middle of the page outward. The final outside shape should be quite different from the original shape.

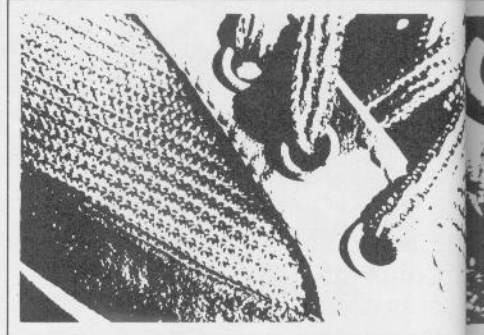
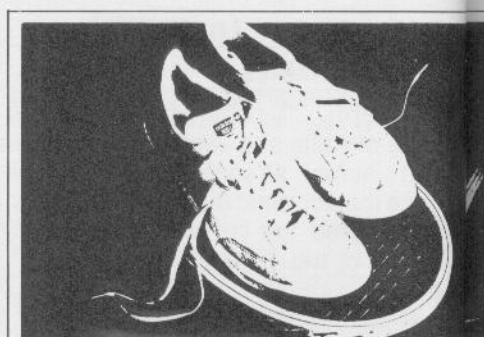


above: 56. Return to a Square by Kunio Yamanaka, drawing. This computer drawing presents concentric images of a square that progressively change into a human head, and back again into a square.

Image formation



57, 58. Silhouettes by Mario Cerolli. A floodlight placed in front of subjects is used to cast shadows, which are subsequently traced to large sheets of paper. Combinations of tracings are used to make paintings, reliefs, and three-dimensional constructions.



2-18 / Silhouettes

Concept: Compressing volumetric form to flat shapes and silhouettes.

Do: 1. Direct a light source (a lamp or spotlight) in front of a subject so that its shadow is projected onto a large sheet of butcher paper taped to the wall. (Use figures in various poses and gestures, and/or inanimate objects.)

2. Trace the outlines of the shadows to the paper. Change positions of the light source to change the quality and size of the projected images; trace these as well.

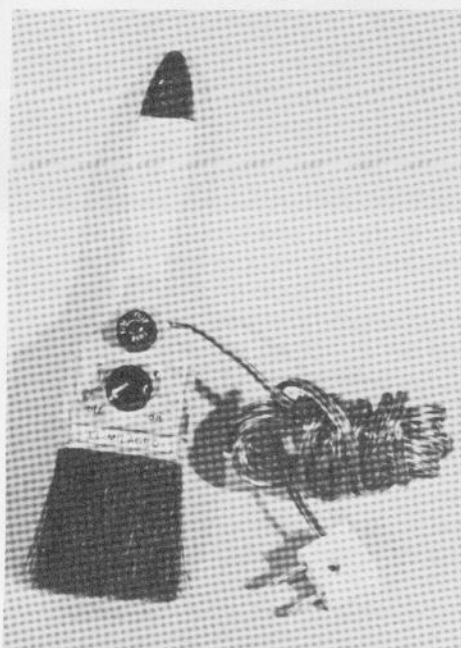
3. Make a mural. Paint with acrylic or tempera.

4. Variation: Project shadows onto plywood and cut out shapes with a portable saber saw. Cut out additional shapes and nail components together to make freestanding units. Paint with acrylic or tempera.

2-19 / New Appendages

Concept: Changing perceptions of commonplace objects through the incorporation of a new appendage.

Do: 1. Attach a handle, faucet, electric cord, electric switch, et cetera, to an object that normally doesn't have one — can you imagine a faucet on a watermelon, an electric cord on a paintbrush?



59. El Milagro (The Electric Paintbrush) by Bill Meyers, Mixed media. Courtesy the artist.



2-20 / Zoom

Concept: Developing a composition that shows progressive magnification of a subject.

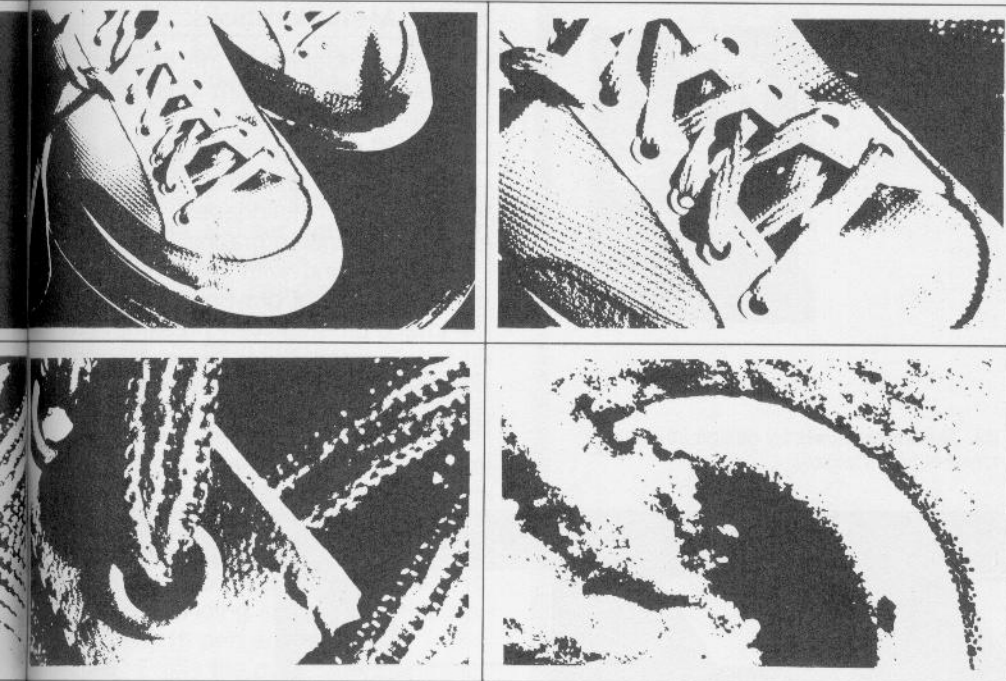
Do: 1. Select either an organic or inorganic object to draw.

2. Divide a large piece of drawing paper into nine equal sections.

3. Starting in the top-left box, draw a representational, overall view of the object as accurately as you can.

4. In the next box to the right, imagine that you have a camera with a zoom lens and draw a close-up portion of the object in accurate detail.

5. In the remaining sections, continue zooming in on the object and enlarging finer details. The last frame should be an enlarged detail created with the aid of a magnifying glass or microscope.



60. Zoom by Phillip Zane, photograph. Courtesy the artist.

2-21 / Design and Function

Concept: Depicting the appearance and function of an object within a single composition.

Do: 1. Select a commonplace object as the subject for this design project: a pair of scissors, hammer, saw, pencil, bicycle, and so on.

2. Make silhouette or contour drawings of the object in several different positions.

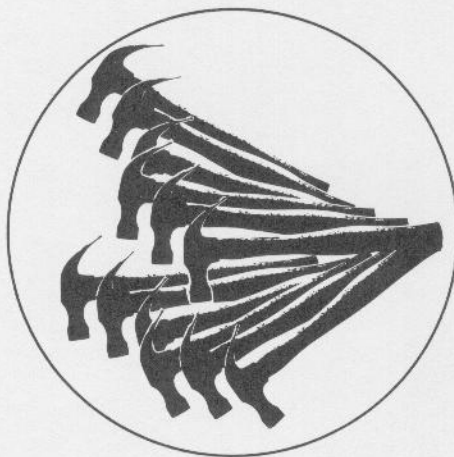
3. Overlap the various drawings and multiple tracings of the object and render in pen and ink.

2-22 / Disguising

Concept: Altering perceptions of an object through camouflage or disguise.

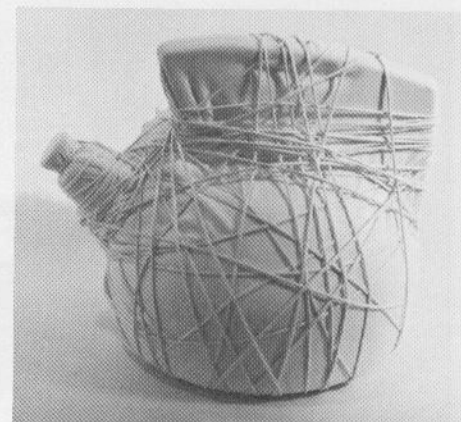
Do: 1. Wrap a three-dimensional object with cloth, thin polyurethane, or some other flexible material.

2. Bind with rope, tape, twine, or wire.



above: 61. The form and function of a hammer is graphically integrated in this design.

above right: 62. Wrapping and binding commonplace objects automatically transforms them into mysterious forms.



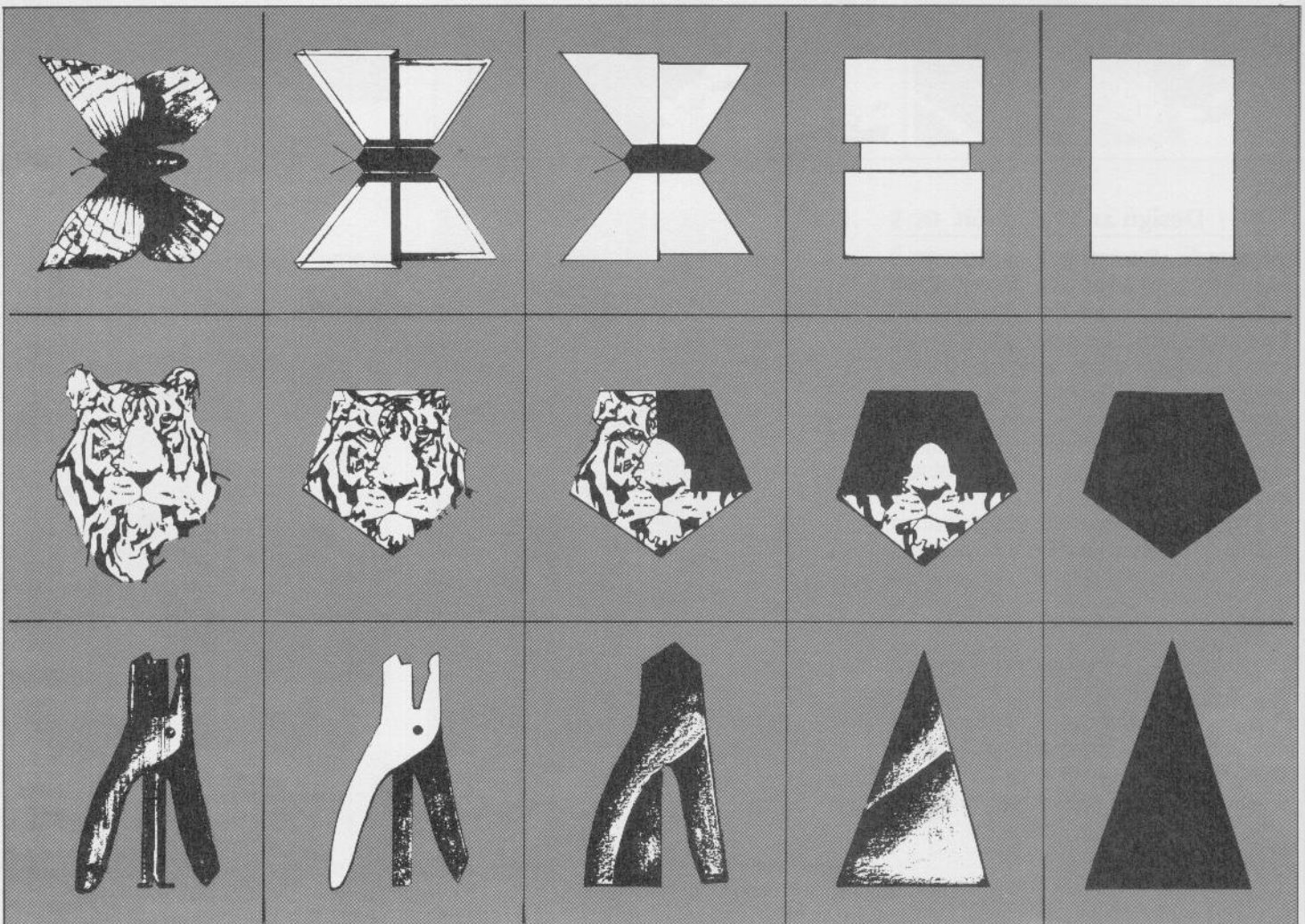
2-23 / Metamorphosis

Concept: Depicting the transformation of an object from one physical state to another.

Do: 1. Select two dissimilar images — one organic, the other inorganic — from books, dictionaries, or other sources for finding graphic images.

2. Starting with the first image, make a series of drawings that depict the image progressively breaking down (in four increments or more) to a geometric shape such as a triangle, circle, diamond or square.

63. **Metamorphosis** by design students,
University of Calgary.



Just image

2-24 / Distortion Grids

Concept: Altering images through the use of distortion grids.

Do: 1. Cut out a photographic image of a person's head from a magazine, poster, or newspaper.

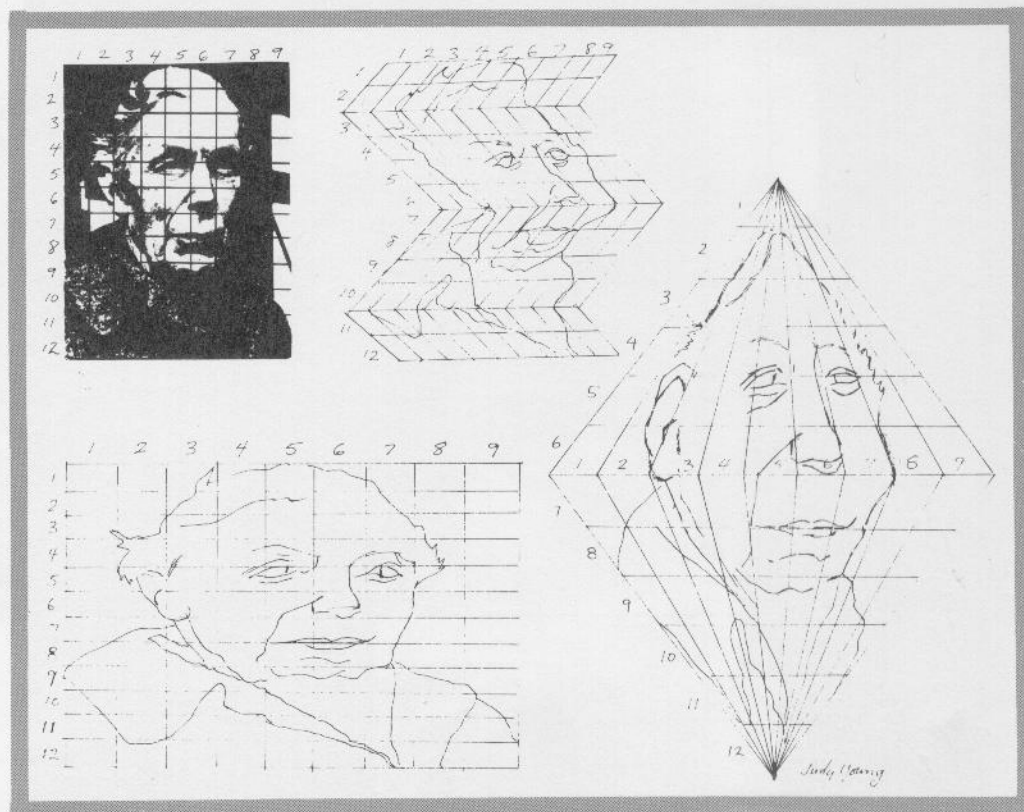
2. Select one of the three grids shown (right) and subject the image to the distortion it creates.

3. Using a ball-point pen, draw horizontal and vertical lines on the photo 1/4" (6 mm) apart.

4. On a sheet of drawing paper, draw an enlarged version of one of the grids pictured below in light pencil lines, making sure the grid has the same number of horizontal and vertical lines as the photo.

5. Carefully examine each segment of the photo and transfer details to the corresponding segment of the distortion grid in pen and ink.

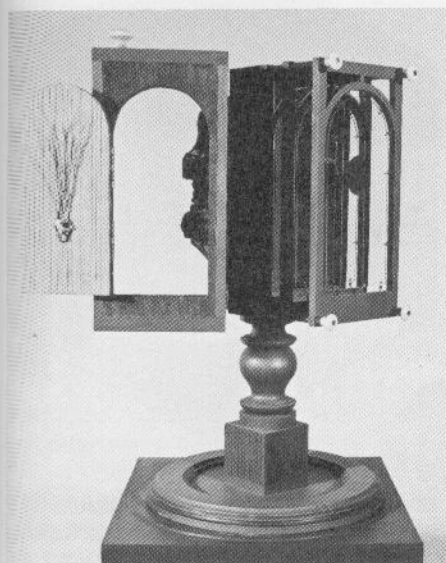
6. Erase the pencilled grid lines.



2-25 / Hidden Structure

Concept: Making structures with concealed elements.

Do: 1. Design and make a three-dimensional construction that "opens up" to reveal an interior structure.



left: 64. Along the Road by Tony Urquhart, 1975, 54" (137.2 cm) high, mixed media. Box sculpture that opens. Courtesy Art Gallery of Ontario, Toronto.

center: 65. Crushed Pop Cans (detail of a mural) by students of Ernest Manning High School, Calgary, Alberta. Courtesy Barry Marks, Tom Hutton.

2-26 / Art from Scrapped Objects

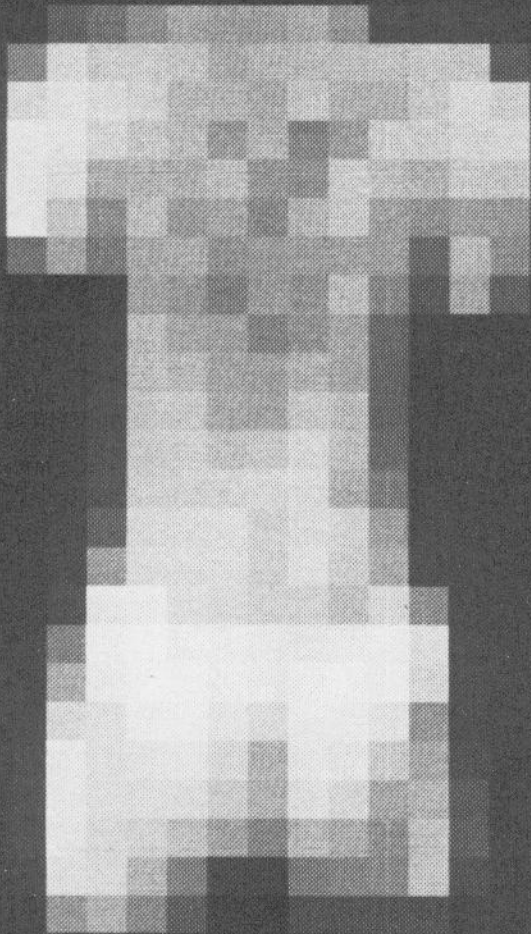
Concept: Making drawings from crushed, rusted, or altered objects.

Do: 1. Comb the neighborhood for objects that have been altered by accident, such as soda pop cans crushed by traffic, or altered by effects of nature, such as rusted signs. Look for objects that have been partially burned, broken, crushed, dissolved, or disintegrated.

2. Use the objects as still-life subjects for drawing.

3. Use colored chalk and work big on 30" x 40" (75 x 100 cm) butcher paper. Draw details of the subject but freely exaggerate or abstract the colors.

above: 66. Distortion Grids by Judy Young, 1980, 8" x 10" (20.3 x 25.4 cm), pen and ink. Courtesy the artist. This work demonstrates three different methods of using distortion grids to enlarge and abstract an image.



67. Torso by Ron Cooper, 1980, lithographic ink on aluminum. Courtesy the artist. A computer-digitized image. Viewed closely, the image is abstract, yet from a distance the fragmented figure pops back into its original representational form. Clarity is also reconstituted by squinting at the image.

2-29 / Lens Box

Concept: Creating kinetic effects with lenticular glass.

Do: 1. Create a design, drawing, painting, collage, or photograph. From a local glass shop, obtain a piece of patterned, lenticular, or louvered glass (commonly used as shower glass) cut the same size as your design.

2. Position the glass over the design and slowly move it up and down to determine the most interesting transformation.

3. Measure the distance between the glass and the design. Make a box to hold the design. (The height of the box is determined by the desired transformation).

4. Glue the design to the inside of the box and fasten the glass to the top with fabric tape.

2-27 / Block Patterns

Concept: Breaking down a photographic image into geometric patterns.

Do: 1. Select a black-and-white photographic image (a head or figure) from a magazine, newspaper, poster, or an original photo.

2. Tape a sheet of translucent drafting paper marked in a 1/4" (6 mm) grid over the image.

3. Study each segment of the photo carefully through the transparent paper. In pencil, render each square with a solid gray tone that represents the average tonality of that square.

4. Continue rendering all the component squares until the composition is complete.

5. Mount on white construction paper or illustration board.

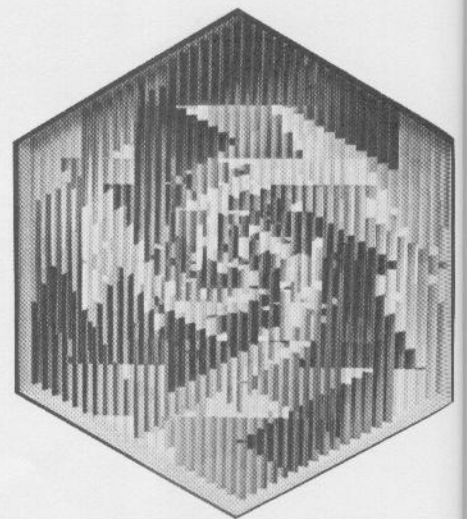
2-28 / Select Focus

Concept: Making drawings that emulate visual perception.

Do: 1. Set up a still-life arrangement.

2. Place a colored tack anywhere on the still life (this represents your focal point).

3. Draw the subject but vary the rendering from very sharp focus (immediately around the focal point) to progressively softer, "out of focus" rendering in the peripheral areas.



68. Panoramagram Rotative by Tim Armstrong, 1968. Courtesy Onnasch Gallery, Berlin. Painted designs are optically (and kinetically) transformed by installing louvered shower glass over the design's surface. Colors and forms optically shift as the spectator moves in front of the work.



above: 69. Cast shadows provide a rich source for design experiments.

center: 70. Design Transformation by Nicholas Roukes, 1980, pen and ink. Design evolved through analysis and recombination of the shapes found in a telephone.

*Image Formation
By the way in
Think / See*

2-30 / Synectic Shadows

Concept: Creating designs from cast shadows.

Do: 1. Set up a still-life subject such as a houseplant, bicycle, or various kitchen or shop tools.

2. Illuminate the still life with three floodlights that have a red, blue, and green bulb respectively. Notice that the colored lights combine to produce white light. Notice further that the cast shadows are not black, but brilliant hues of magenta, cyan blue, and yellow.

3. Tape white drawing paper on a board and move it behind the still life to find interesting cast shadows.

4. Support the drawing board on a chair and carefully trace the cast shadows with colored chalk. Shift the drawing board and superimpose several drawings to make an interesting composition.

5. Learn more about light color theory and apply the information towards further experimentation.

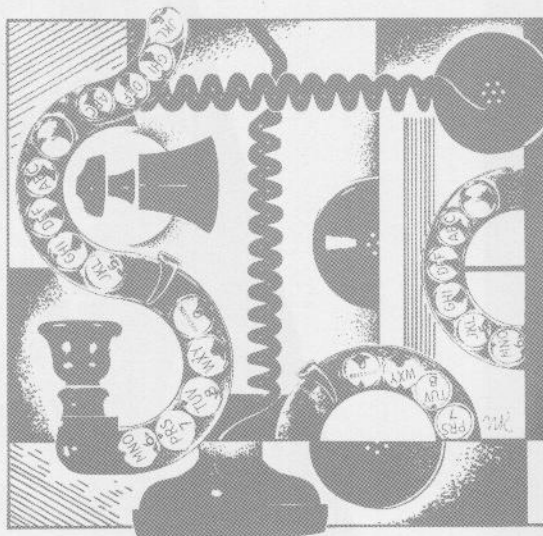


Image-formation

2-31 / Recombining

Concept: Analyzing and recombining shapes.

Do: 1. Carefully draw the separate parts of an object such as a typewriter, camera, binoculars, egg beater, pencil sharpener, telephone, et cetera.

2. On a separate piece of tracing paper, trace and recombine the elements to produce a unique composition. Combine front, side, and top views.

3. Transfer to illustration board and render with media of your choice.

2-32 / Form—Forces—Energies

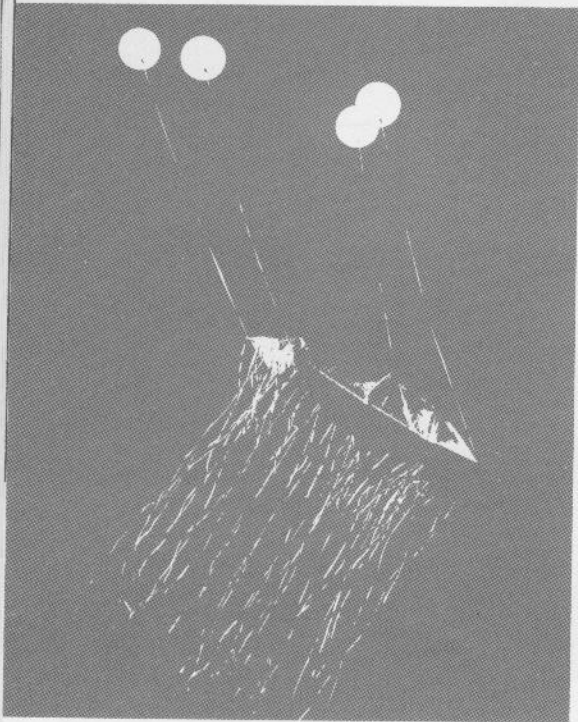
Concept: Creating structures that involve design determined by forces or energies.

Do: 1. Create a three-dimensional structure or form based on experiments with one of the following forces:

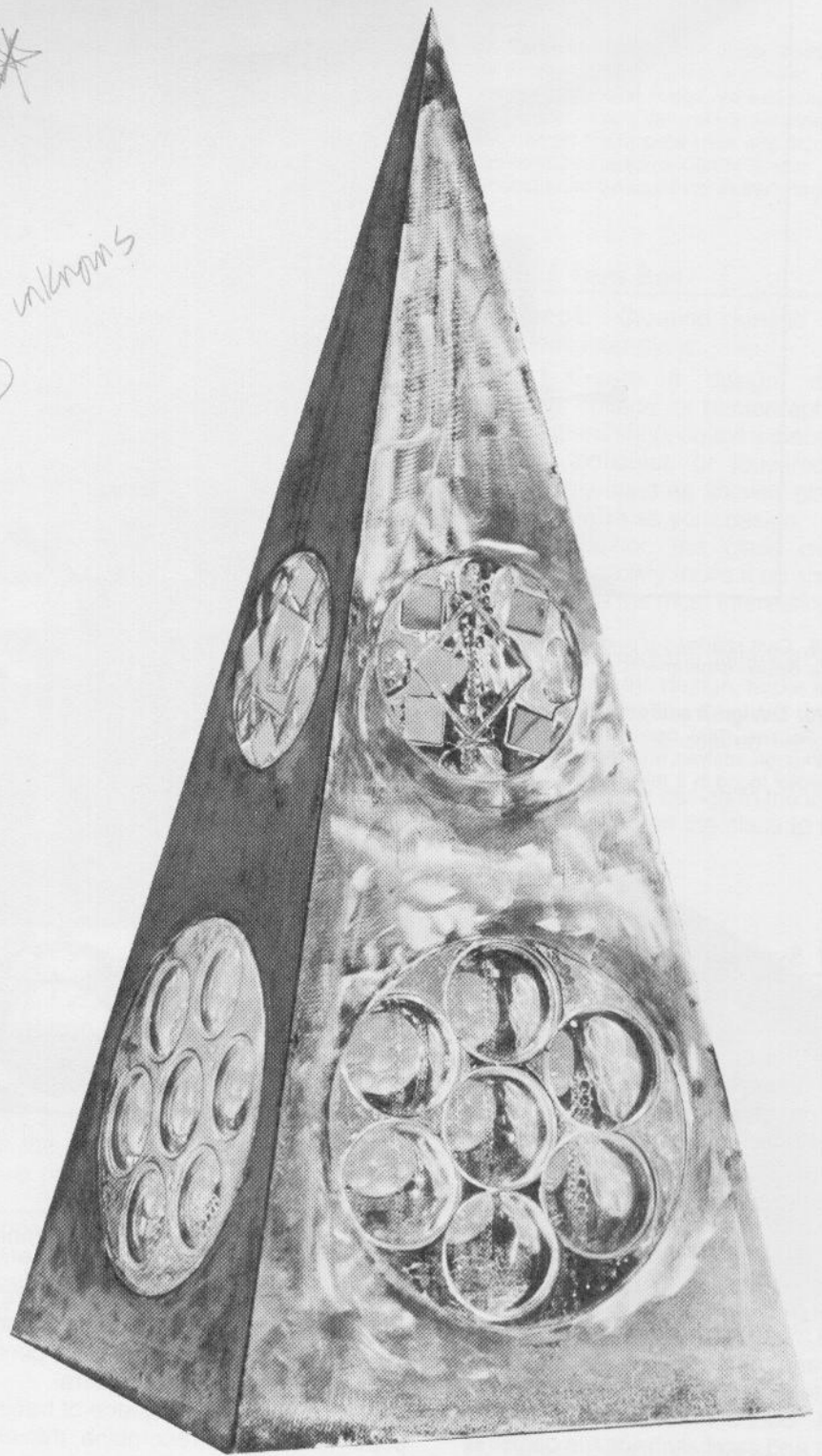
magnetic field	light
wind	decomposition
gravity	sound
organic growth	ice
water or fluids	snow
chemical action	pressure



unknowns



71. Skypede by Howard Woody, 1978, mirrorized mylar, nylon, 40" weather balloons, helium. Courtesy the artist. This flying sculpture was inspired by the shape and form of an underwater creature. Constructed of thin segments of plastic that were heat laminated to form a luminous shape, it was inflated with helium. Before launching, a flight pattern was determined and reported to local aviation offices and to the control tower of the local airport. Flights of Woody's inflatables average two hours; this sky sculpture climbed to an altitude of 8200' and traveled 25 miles before finally bursting from atmospheric pressure. The artist says of his work: "My sky sculpture responds to the invisible energies in the atmosphere and gives a visible definition to that energy. The flight life is the sculptural form."



72. Obelisk (Magiscope) by Feliciano Bejar, 1967, metal, plastic and crystal lenses. Courtesy the artist. Photo by Bob Schalkwijk.