

# TWO DIMENSIONAL DESIGN

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## CHAPTER 6: GRADATION

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## DEFINITION:

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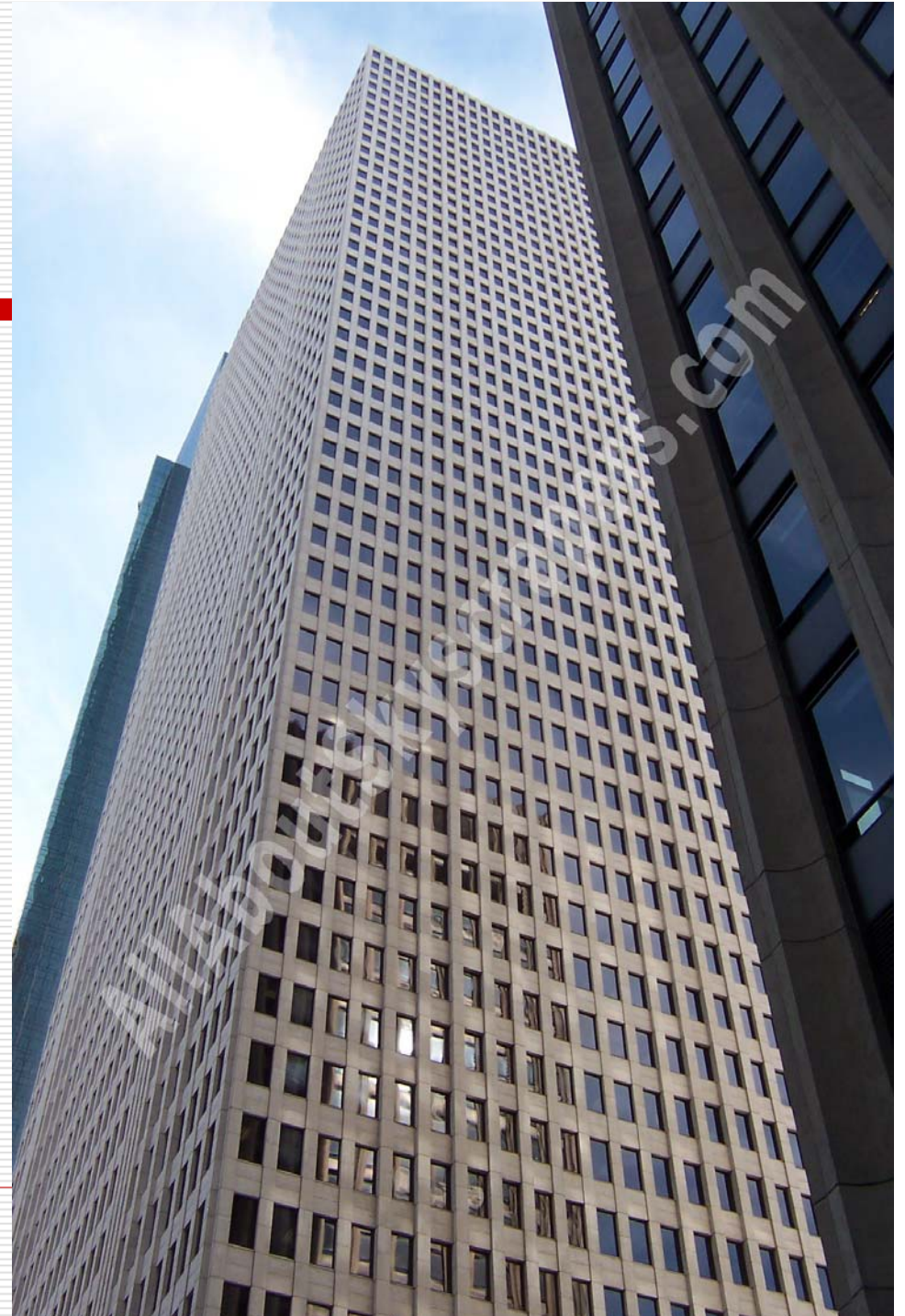
Gradation is a daily visual experience. Things that are close to us appear large and those that are far from us appear small.



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If we look at a tall building with a façade of regular window patterns from a very low angle, the change in size of the windows suggests a law of gradation.

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## **GRADATION OF UNIT FORMS:**

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Within a repetition structure, unit forms can be used in gradation.

The unit forms can have gradation of shape, size, color, texture, direction, position, space and gravity.

Taking off the gravity, color and texture, the rest fall into three main groups:

- Planar gradation,
  - Spatial gradation, and,
  - Shape gradation.
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## GRADATION OF UNIT FORMS:

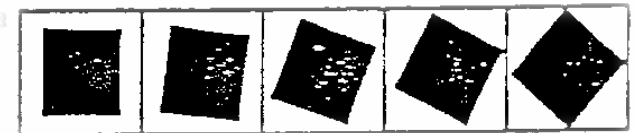
### 1- PLANAR GRADATION

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DEVIDED INTO TWO KINDS

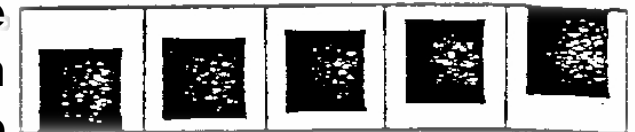
#### a. Planar rotation:

This indicates the gradual change of direction of the unit forms. A shape can be rotated without diversion from the picture plane.



#### b. Planar progression:

This indicates the gradual change of position of the unit forms within the structure subdivisions of a design. This unit forms can ascend to descend, or shift from one corner to another in a sequence of regular, gradual movements.



## GRADATION OF UNIT FORMS:

### 2- SPATIAL GRADATION

DEVIDED INTO TWO KINDS



#### a. Spatial rotation:

The unit form can be rotated so that we see more and more of its edge, and less and less of its front. A flat shape can become narrower and narrower until it is almost a thin line. Spatial gradation changes the shape of a unit form.



## GRADATION OF UNIT FORMS:

### 2- SPATIAL GRADATION

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#### **b. Spatial progression:**

This is the same as the change of size. Increase or decrease of the size of unit forms suggests the forward or backward progression of unit forms in space.



The unit forms are always parallel to the picture plane, but they may appear far behind the picture plane when it is small, or even in front of the picture plane when it is large.

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### **3- SHAPE GRADATION**

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**This refers to the sequence of gradations which are results of actual change of shape.**

#### **TWO COMMON KINDS OF SHAPE GRADATION**

- a. Union or subtraction**
  - b. Tension or compression**
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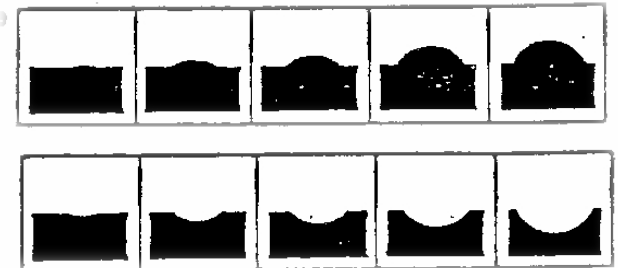
## GRADATION OF UNIT FORMS:

### 3- SHAPE GRADATION

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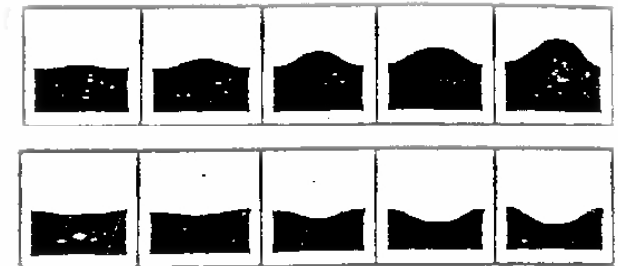
#### a. UNION OR SUBTRACTION:

This indicates the gradual change of position of sub-unit-forms, which make up the unit forms proper by union or subtraction.



#### b. Tension or compression:

This indicates the gradual change of shape of unit forms by internal or external forces. The shape appears as if it is elastic, easily affected by any slight push or pull.



## **THE PATH OF GRADATION**

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**Any form can be gradually changed to become any other form. How the change takes place is determined by the path of gradation chosen.**

**There are multiple paths of gradation, planar, spatial, or shape gradation**

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## THE PATH OF GRADATION

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### 1. Shape gradation path



If we wish to change a circle into a triangle, the circle can be stretched and squeezed to become more and more triangular.



Or it can be subtracted from three sides until it becomes a triangle.

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## THE PATH OF GRADATION

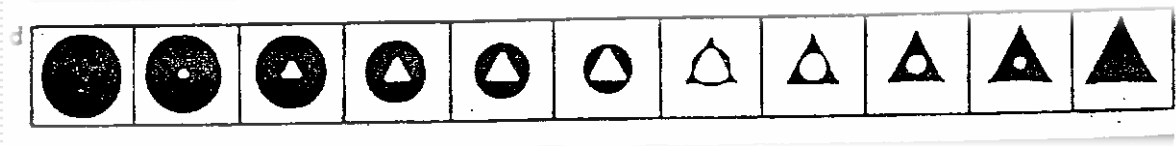
### 2. Planar gradation path



The circle can be shifted upwards followed by a triangle which will occupy the entire structural subdivision when the circle has completely moved out.

## THE PATH OF GRADATION

### 3. Spatial gradation path



The circle can gradually diminish while the triangle can emerge, first as a dot and then as a small triangle which gradually expands.

## THE PATH OF GRADATION

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### 3. Spatial gradation path

Or the circle can gradually expand beyond the confines of the structural subdivision when the triangle also emerges.



## THE PATH OF GRADATION

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### 3. Spatial gradation path

We can also consider the circle as a bottom of a cone which rotates to give the triangular front elevation.



## **THE SPEED OF GRADATION**

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**The number of steps required for a form to change from one situation to another determines the speed of gradation.**

**When the steps are few, the speed becomes rapid, and when the steps are many, the speed becomes slow.**

**The speed of gradation depends on the effects a designer wishes to achieve. A rapid gradation causes a visual jerks, whereas a slow gradation evolves smoothly. Optical illusion is usually the result of slow gradation.**

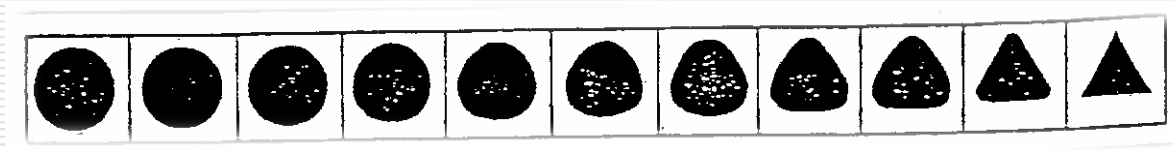
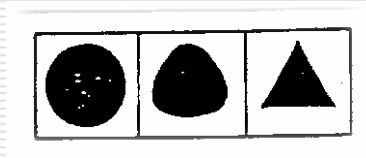
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## THE SPEED OF GRADATION

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If a form changes too rapidly, there may not be a feeling of gradation at all



## **PATTERNS OF GRADATION**

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In gradation design, 2 factors are of importance in pattern construction:

- The range of gradation and,
- The direction of movement.

### **The range of gradation:**

It is marked by a starting situation and a terminating situation.

### **The direction of movement:**

It refers to the orientations of the starting and the terminating situations and its relationship.

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## MOVEMENT PATTERNS

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**Some typical movement patterns in gradations are:**

**-Parallel movement,**

**-Concentric movement,**

**-Zigzag movement.**

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## MOVEMENT PATTERNS

### - Parallel movement:

This is the simplest. Unit forms are transformed gradually in parallel steps.

In parallel movement, the climax is usually a straight line.

In the figure, the numerals signify the varying degrees of gradation and the solid lines divide the area into zones, with each zone containing unit forms of the same step.

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5

1	2	3	4	5
2	3	4	5	6
3	4	5	6	7
4	5	6	7	8
5	6	7	8	9

## MOVEMENT PATTERNS

### - Concentric movement:

This means that the unit forms are transformed in concentric layers.

3	3	3	3	3
3	2	2	2	3
3	2	1	2	3
3	2	2	2	3
3	3	3	3	3

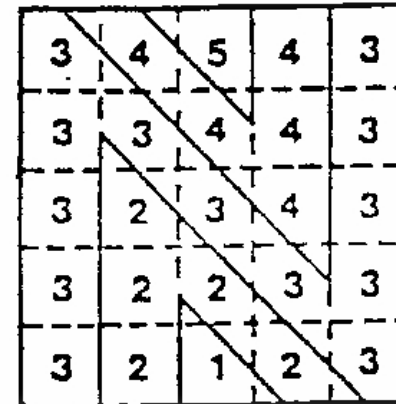
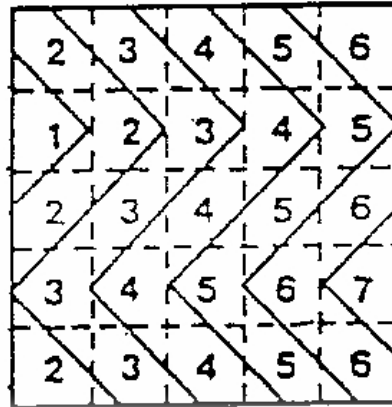
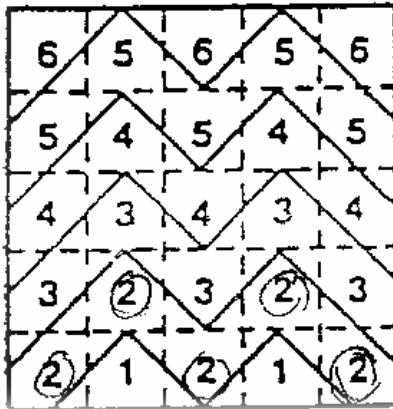
5	4	3	4	5
4	3	2	3	4
3	2	1	2	3
4	3	2	3	4
5	4	3	4	5

3	2	1	2	3
2	2	1	2	2
1	1	1	1	1
2	2	1	2	2
3	2	1	2	3

## MOVEMENT PATTERNS

### - Zigzag movement:

This means that the unit forms of the same step are arranged in a zigzag manner.



## MOVEMENT PATTERNS

The number of steps in previous figures can be extended infinitely.

1	1	1	1	1	4	4	4	4	4
2	2	2	2	2	5	5	5	5	5
3	3	3	3	3	6	6	6	6	6
4	4	4	4	4	7	7	7	7	7
5	5	5	5	5	6	6	6	6	6
6	6	6	6	6	5	5	5	5	5
7	7	7	7	7	4	4	4	4	4
6	6	6	6	6	3	3	3	3	3
5	5	5	5	5	2	2	2	2	2
4	4	4	4	4	1	1	1	1	1

1	1	1	1	1	5	4	3	2	1
2	2	2	2	2	5	4	3	2	1
3	3	3	3	3	5	4	3	2	1
4	4	4	4	4	5	4	3	2	1
5	5	5	5	5	5	4	3	2	1
1	2	3	4	5	5	5	5	5	5
1	2	3	4	5	4	4	4	4	4
1	2	3	4	5	3	3	3	3	3
1	2	3	4	5	2	2	2	2	2
1	2	3	4	5	1	1	1	1	1

9	8	7	6	5	1	2	3	4	5
8	7	6	5	4	2	3	4	5	6
7	6	5	4	3	3	4	5	6	7
6	5	4	3	2	4	5	6	7	8
5	4	3	2	1	5	6	7	8	9
1	2	3	4	5	9	8	7	6	5
2	3	4	5	6	8	7	6	5	4
3	4	5	6	7	7	6	5	4	3
4	5	6	7	8	6	5	4	3	2
5	6	7	8	9	5	4	3	2	1

1	2	3	4	5
5	4	3	2	1
1	2	3	4	5
5	4	3	2	1
1	2	3	4	5

b

1	2	3	4	5
6	5	4	3	2
1	2	3	4	5
6	5	4	3	2
1	2	3	4	5

c

1	2	3	4	5
9	8	7	6	5
1	2	3	4	5
9	8	7	6	5
1	2	3	4	5

# THE GRADATION STRUCTURE

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**It is similar to a repetition structure except that the structural subdivisions do not remain repetitive but change in size, shape, or both in gradual, systematic sequence.**

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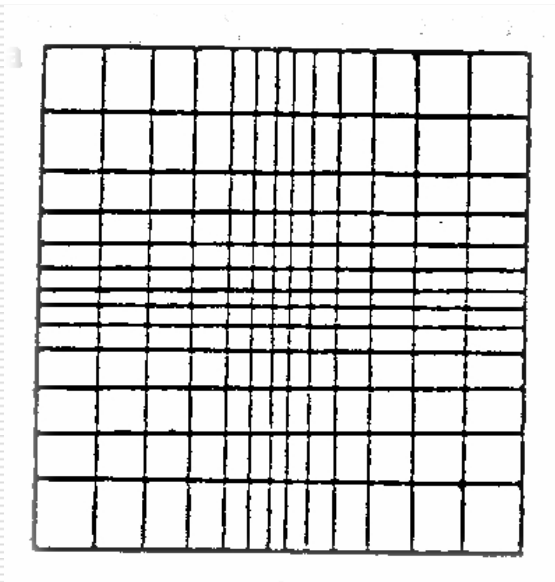


## **TYPES OF GRADATION STRUCTURE:**

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### **a. Change of size and/or proportion:**

The structural subdivisions of a basic grid can increase or decrease in size (with or without change of proportion) gradually from one to the next.

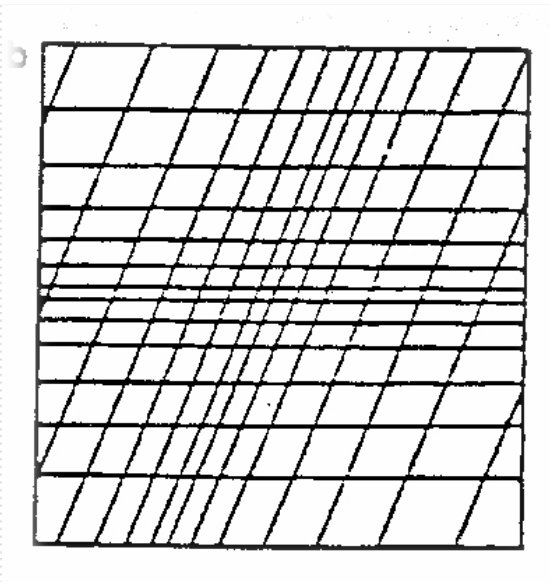


**TYPES OF GRADATION STRUCTURE:**

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**b. Change of direction:**

The entire set of vertical or horizontal structural lines, or both in the previous figure can be tilted in any desired direction.

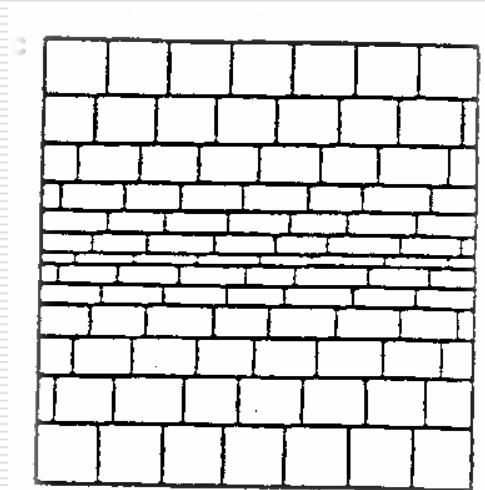


## TYPES OF GRADATION STRUCTURE:

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### c. Sliding

The entire row of vertical or horizontal structural subdivisions in the last 2 figures can be made to slide regularly so that one subdivision is not directly next to or above another.

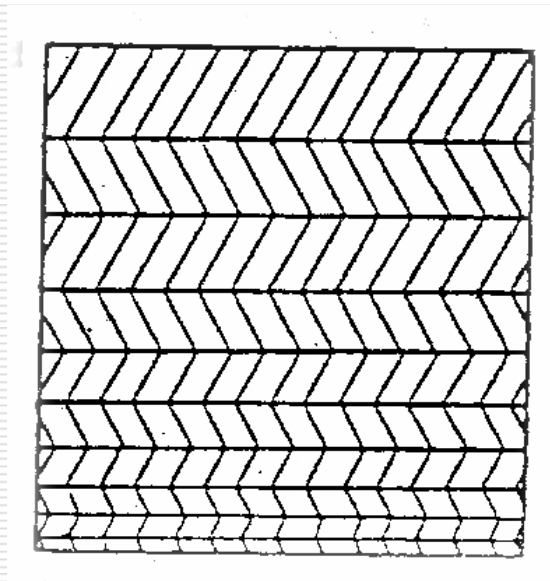


**TYPES OF GRADATION STRUCTURE:**

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**d. Curving, bending:**

The entire set of vertical or horizontal structural lines, or both in the last figures can be curved or bent gradually or regularly.

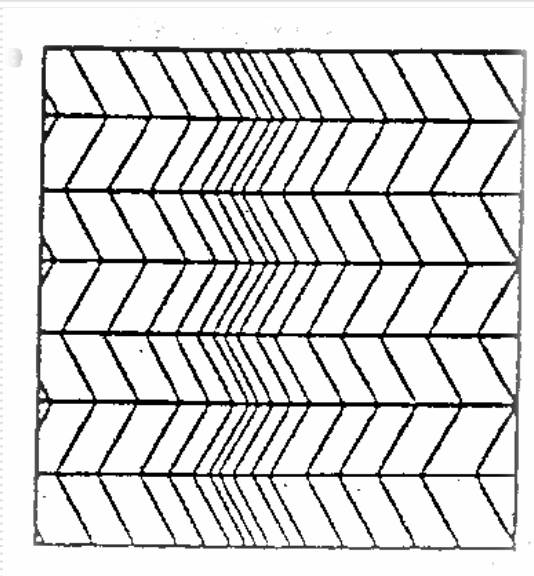


TYPES OF GRADATION STRUCTURE:

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e. Reflecting:

A row of non-right-angled structural subdivisions can be reflected and repeated alternately or regularly.

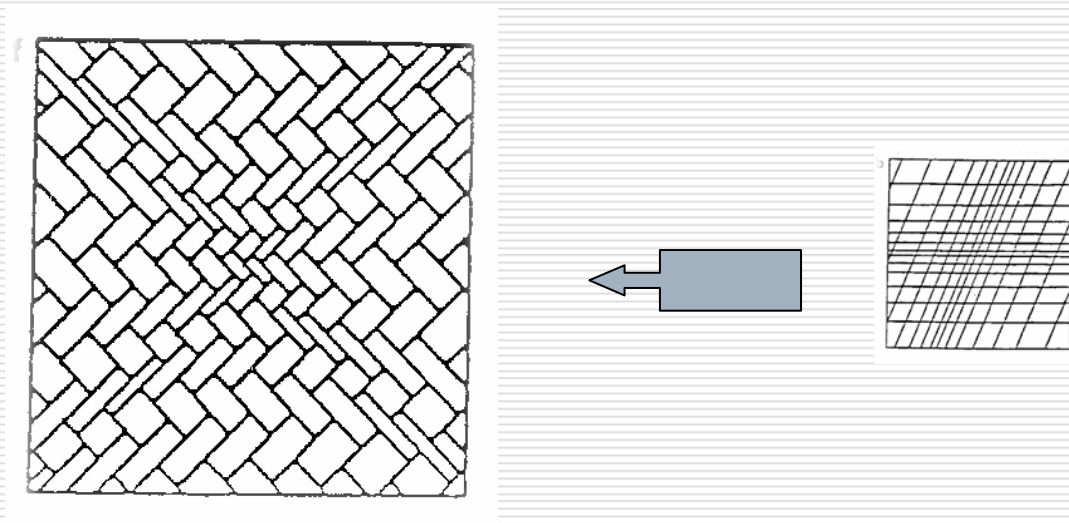


TYPES OF GRADATION STRUCTURE:

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f. combining:

Structural subdivisions can be combined to form bigger or more complex shapes with the effect of gradation.

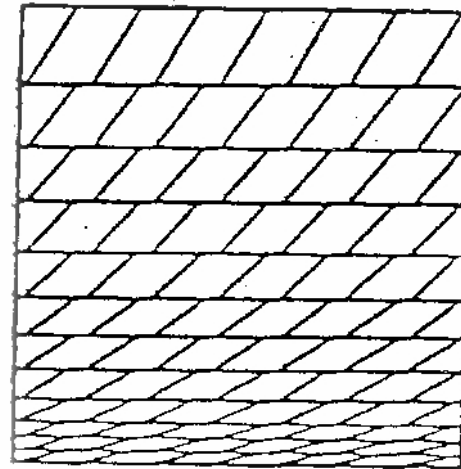


TYPES OF GRADATION STRUCTURE:

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g. Further dividing:

Structural subdivisions in all gradation structures can be subdivided into smaller or more complex shapes.

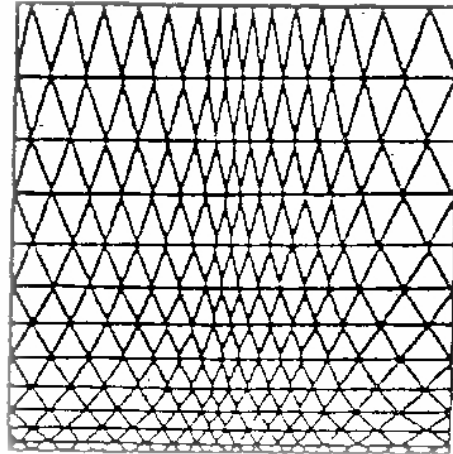


## TYPES OF GRADATION STRUCTURE:

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### h. The triangular grid:

The triangular grid of a repetition structure can be transformed into a gradation structure by gradually varying the size and shape of the triangles.



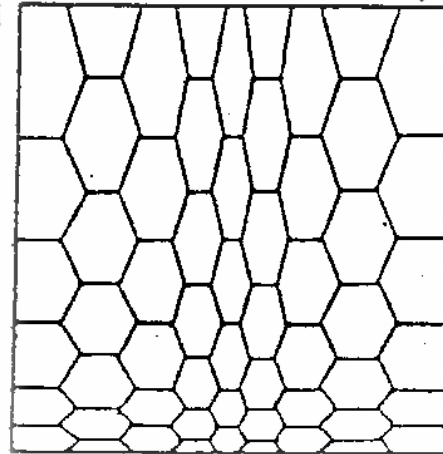


## TYPES OF GRADATION STRUCTURE:

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### i. The hexagonal grid:

The hexagonal grid of a repetition structure can be transformed into a gradation structure by gradually varying the size and shape of the hexagons.

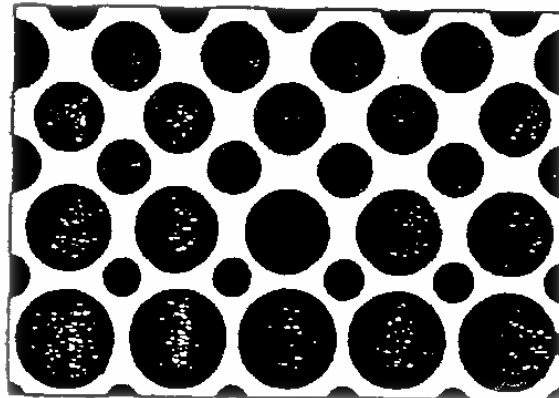


## ALTERNATE GRADATION

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If the unit forms are in gradation of size, the space left over by diminishing unit forms can be used for the accommodation of a set of unit forms in reverse gradation

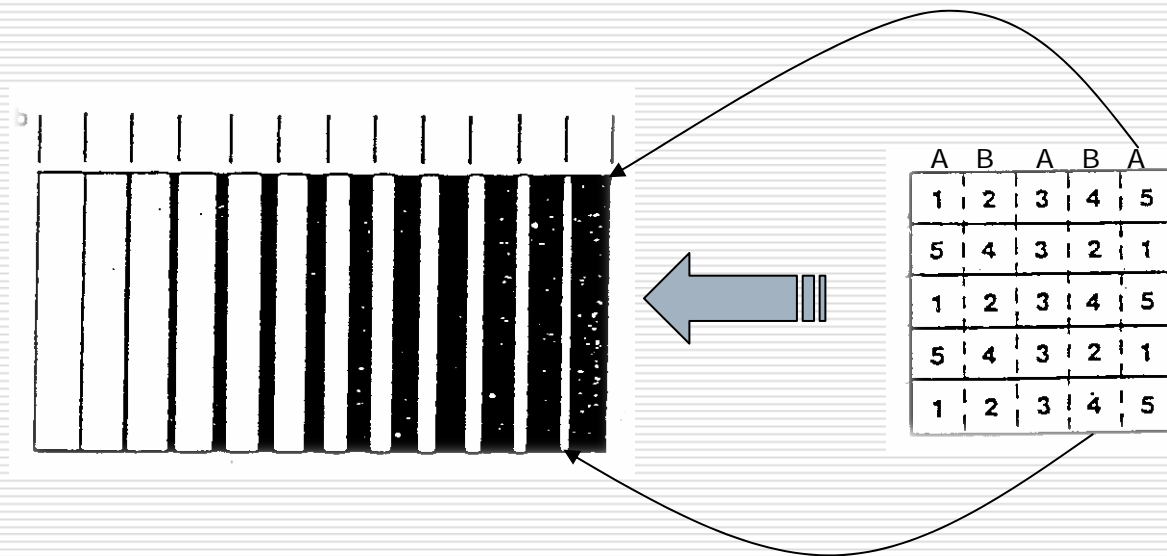
Here the original unit forms can occupy the central portion of the structural subdivisions, whereas a new set of unit forms can occupy intersections of the structural lines.



## ALTERNATE GRADATION

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Alternate gradation can be obtained if the A rows gradually diminish while the B rows gradually expand in the same direction. Black bands standing for the A rows and white bands for the B rows.



## **RELATIONSHIP OF UNIT FORMS AND STRUCTURES IN A GRADATION DESIGN**

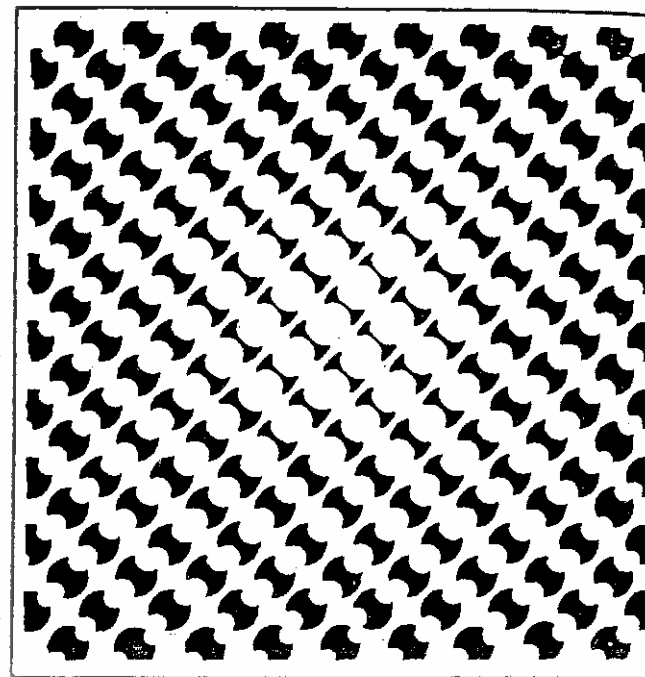
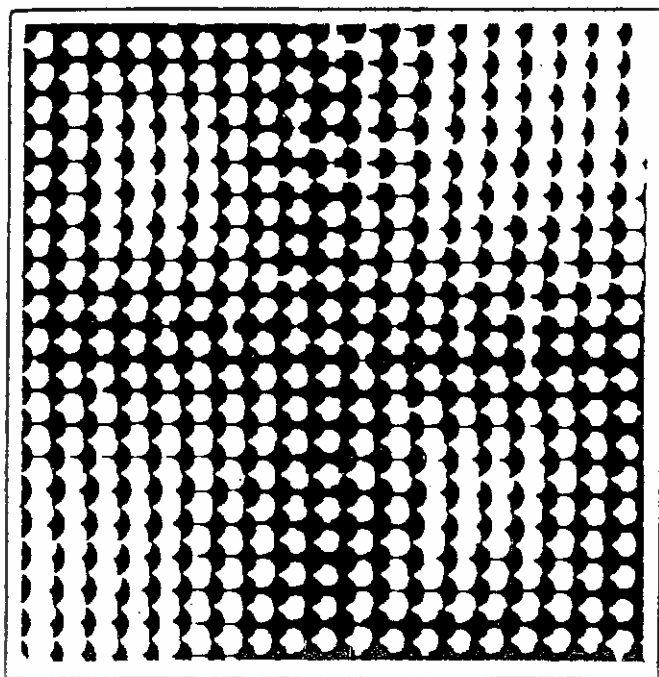
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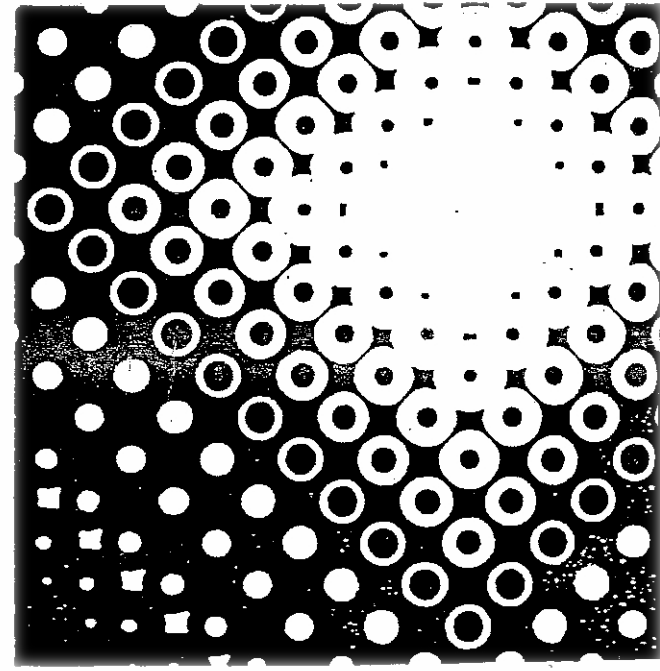
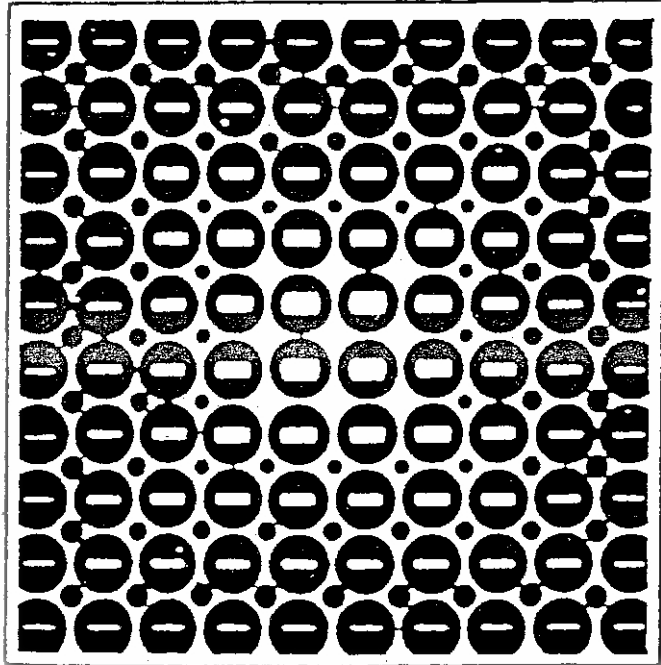
**A gradation design can be obtained in one of the following ways:**

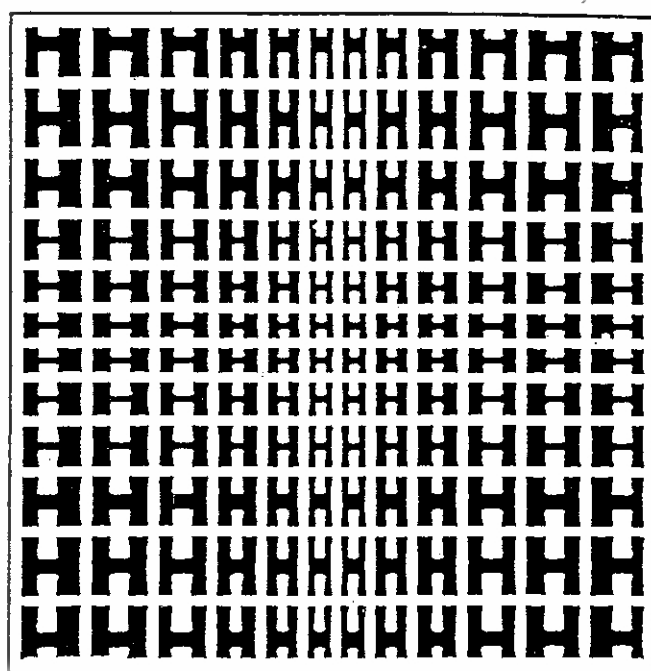
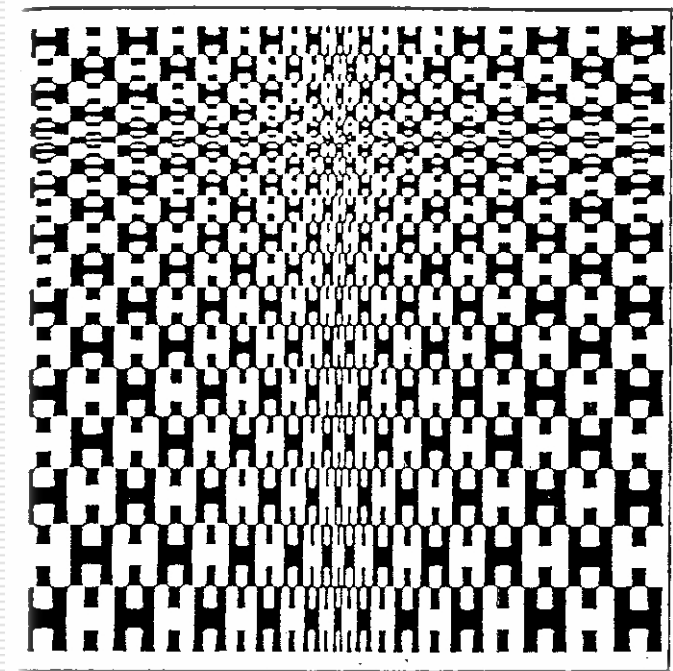
- Gradational unit forms in a repetition structure,**
  - Repetitive unit forms in a gradation structure, and**
  - Gradational unit forms in a gradation structure.**
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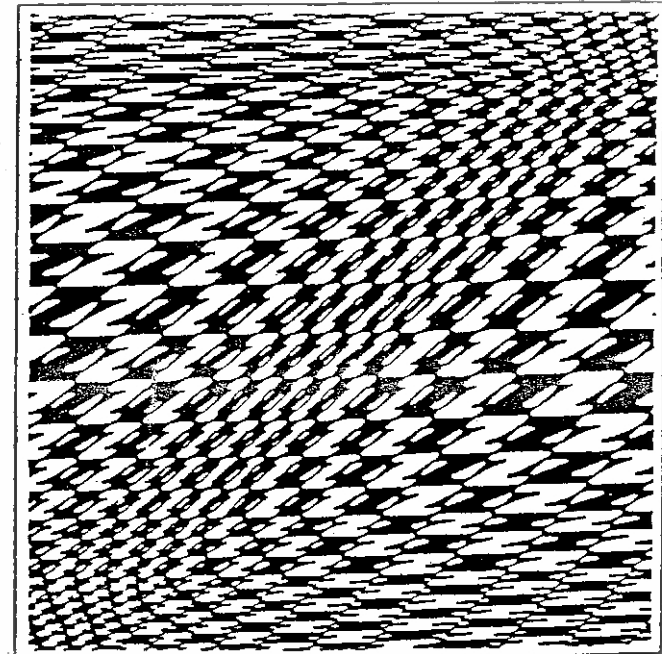
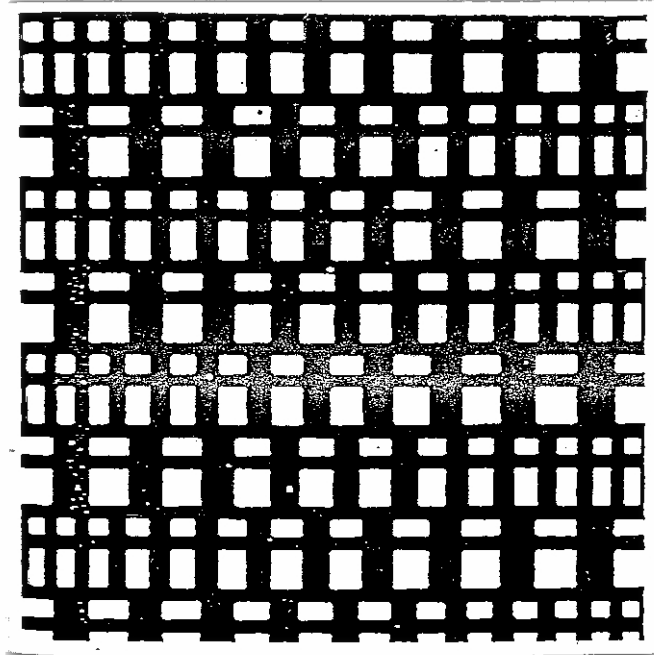
# EXCERSES

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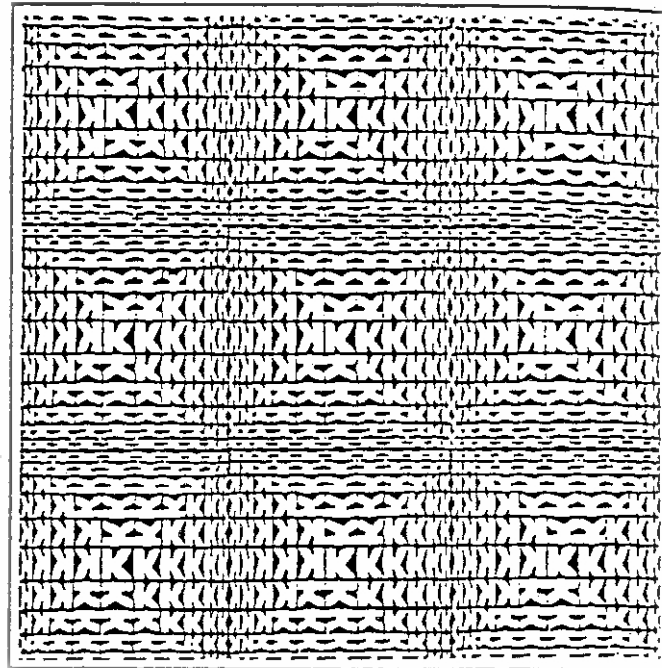
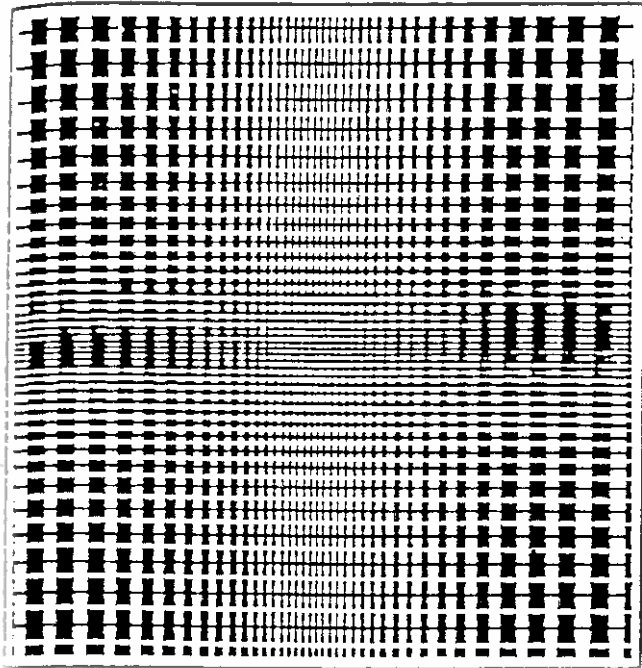


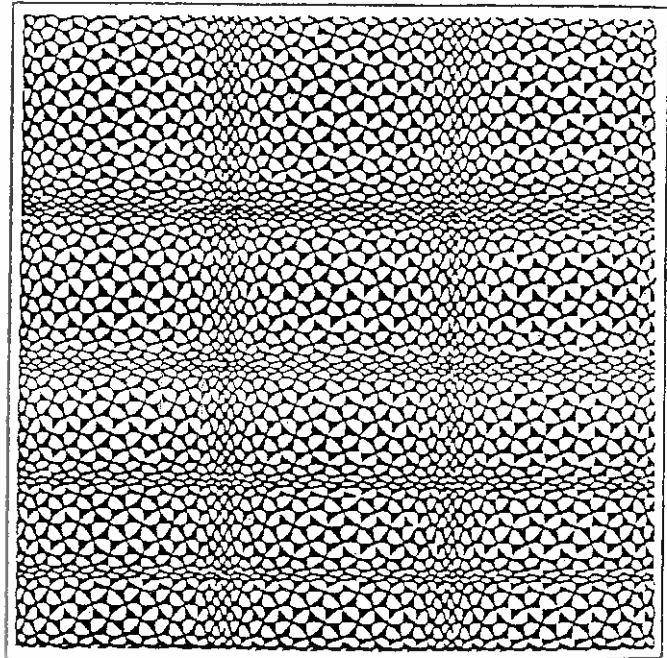
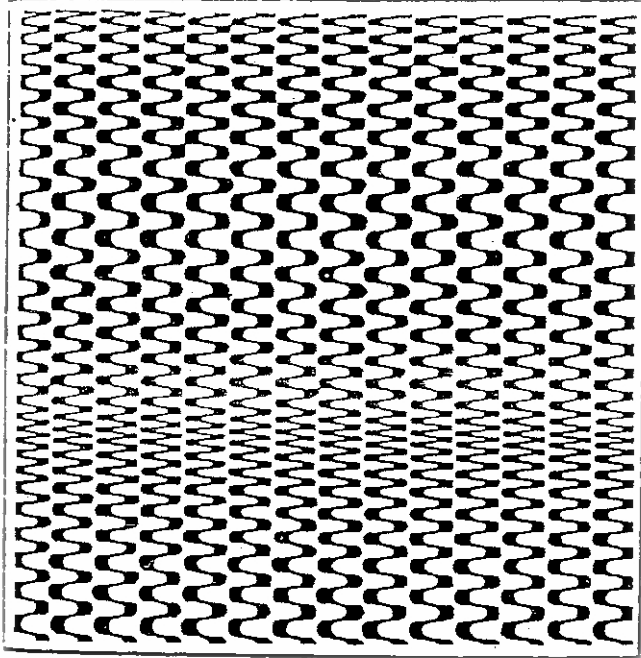












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تم بحمد الله

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